- Economic impact of new processes
- St. Regis' new board machine
- Problems of switchgear applications
- TAPPI and APPA conference proceedings

The Paper Industry

TECHNOLOGY DEPT.
PUBLIC LIBRARY
Publishers of PAPER AND PULP MILL CATALOGUE

87 OF AMERICA'S "FIRST HUNDRED" CORPORATIONS ARE WHITING CUSTOMERS

Welders at work on a Type 317 ELC stainless steel vapor head for a new Swenson Evaporator.

Design plus 317ELC plus Fabrication

. . . the formula for the high quality Swenson Evaporator at Ketchikan

One of the few mills in the world using the magnesium base sulphite process, Ketchikan Pulp Company, Ketchikan, Alaska, called on Swenson engineering to design and fabricate an evaporator capable of handling the corrosive pulping liquors with trouble-free ease. Today, Ketchikan Pulp Company depends on its continuously operating Swenson sextuple-effect evaporator . . . fashioned of Type 317 ELC stainless steel. This quality material combined with superb Swenson craftsmanship helps Ketchikan maintain its production of high grade pulps.

Swenson's extensive experience in design of process equipment combined with its use of the most modern fabricating facilities provides the assurance that high standards of performance and equipment life will be met. *Swenson Evaporator Company, 15653 Lathrop Ave., Harvey, Ill.*

SEND FOR BOOKLET.
Request your copy of "An Open Door" for details on evaporators and other Swenson processing equipment.

SWENSON
Proved Engineering for the Process Industries
Since 1889

A Division of WHITING Corporation

Here's a SPEED REDUCER that lets you

mount the motor where you want it

Versatile **LINK-BELT** *In-Line helical gear drives give wide latitude in drive arrangement*

Make the most of mounting space with quiet, cool-running, oil-tight Link-Belt In-Line helical gear drives. No need to direct-connect the motor. Where layout requirements so dictate—or to achieve even higher reduction at low cost—a chain or gear drive can be used in between. Location of input and output shafts on same planes make installation easy, saves space.

Consists of a streamlined housing with double, triple or quadruple reductions up to 206 hp. Call your authorized Link-Belt stock-carrying distributor or nearby Link-Belt office. Ask for Book 2651.

BOOK 2651

LINK-BELT

SPEED REDUCERS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14.805

Founded on Service...Pledged to Your Future

The Paper Industry

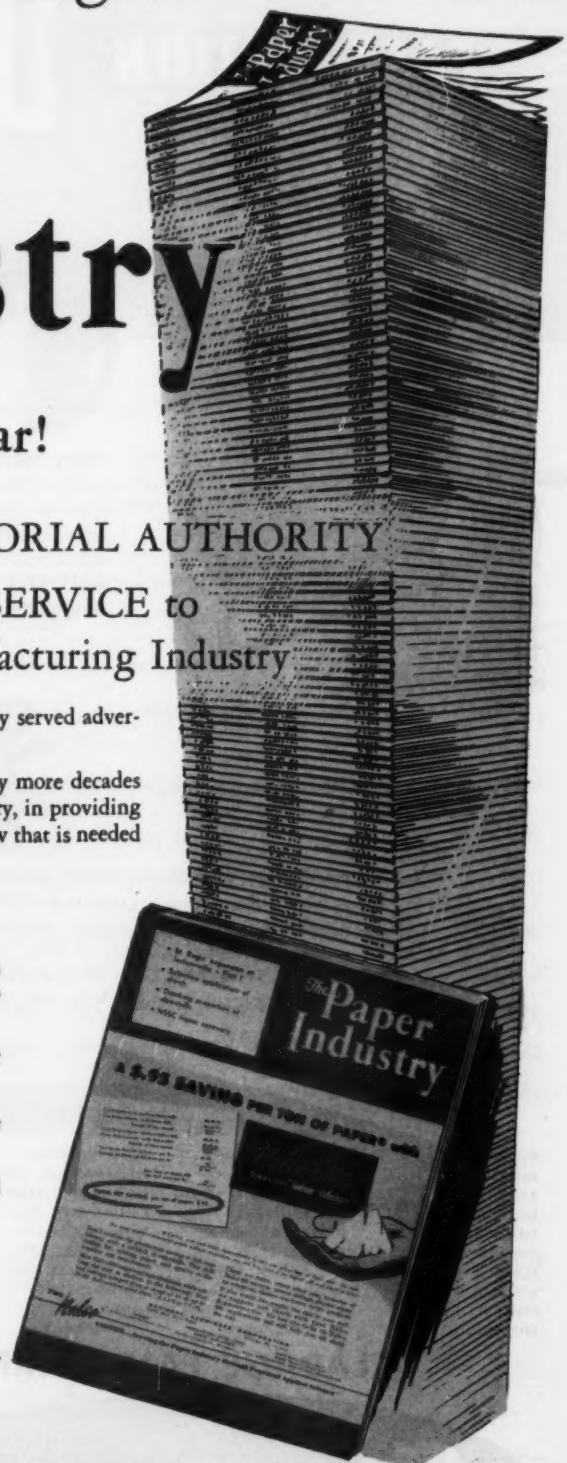
is now entering its 40th year!

STILL a recognized leader in EDITORIAL AUTHORITY

STILL unsurpassed in GENUINE SERVICE to the entire Pulp and Paper Manufacturing Industry

From its founding, The Paper Industry Magazine has consistently served advertisers best . . . because it serves readers best.

With this proud record of service we are looking forward to many more decades of continuous growth to parallel that of the pulp and paper industry, in providing and disseminating technical, engineering and managerial know-how that is needed for the achievement of a high level of productivity.



Things to come in Future Issues

In 1958-59 we are publishing a thorough review in 18 parts on the application of pumps, valves, pipes, and fittings in the pulp and paper manufacturing industry.

A similar series is planned on materials handling, to begin later this year.

Plans are also under way for the development of a review on the present status and technology of paper sizing.

These are only a few examples of the high-lights of our editorial program which places emphasis on

(1) **Uncluttered presentation of material**

(2) **Interpretation rather than straight reporting**

(3) **Easily readable style**

(4) **A balance of material directed toward technology, research, engineering, and management.**

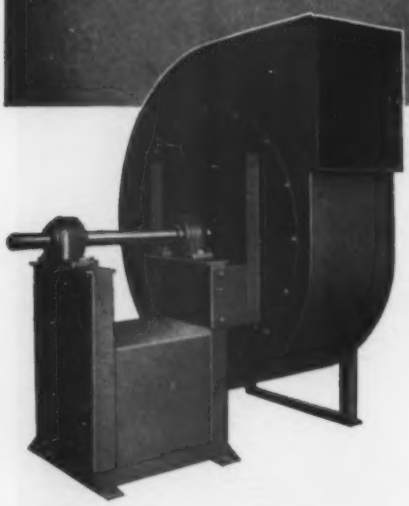
The Paper Industry

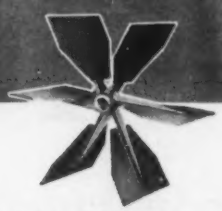
Published Monthly by Fritz Publications, Inc.

431 South Dearborn Street • Chicago 5, Illinois

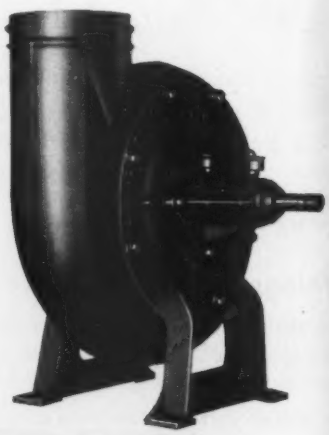
FAST ACTION DELIVERY

Clarage Industrial Air and Material Handling Fans





TYPE XL FANS. Distinguished by advanced design, high efficiency. Universal discharge, 3 different interchangeable wheel types available, reversible for either clockwise or counter-clockwise rotation with rim or open type wheels. Rugged, tight, fabricated steel construction. Pressures to 18" SP. **IMMEDIATE SHIPMENT** on all standard Arrangement 1 and 9 fans. Arrangement 4 and 8 fans also promptly available.



TYPE CI FANS. Proved performers in a wide range of services. Cast iron construction. Universal discharge, 2 different interchangeable wheel types available, reversible for either clockwise or counter-clockwise rotation. 6 sizes, pressures to 24" SP. **IMMEDIATE SHIPMENT** on all standard Arrangement 1 and 2 fans. Arrangement 4 and 8 fans also promptly available.

CALL TODAY the nearest Clarage sales engineering office:

ALBANY, N. Y.
ALBUQUERQUE, N. M.
ATLANTA, GA.
BALTIMORE, MD.
BILLINGS, MONT.
BIRMINGHAM, ALA.
BOSTON, MASS.
BUFFALO, N. Y.
CHARLOTTE, N. C.
CHICAGO, ILL.
CINCINNATI, OHIO
CLEVELAND, OHIO
CORPUS CHRISTI, TEXAS
DALLAS, TEXAS
DAVENPORT, IOWA
DENVER, COLO.
DES MOINES, IOWA
DETROIT, MICHIGAN
FLINT, MICH.
HARTFORD, CONN.
HOUSTON, TEXAS
INDIANAPOLIS, IND.
KALAMAZOO, MICH.
KANSAS CITY, MO.
KNOXVILLE, TENN.
LITTLE ROCK, ARK.
LOS ANGELES, CALIF.
MEMPHIS, TENN.
MIAMI, FLA.
MILWAUKEE, WIS.
MINNEAPOLIS, MINN.
NASHVILLE, TENN.
NEWARK, N. J.
NEW ORLEANS, LA.
NEW YORK, N. Y.
OKLAHOMA CITY, OKLA.
OMAHA, NEB.
ORLANDO, FLA.
PHILADELPHIA, PA.
PITTSBURGH, PA.
PORTLAND, ORE.
RICHMOND, VA.
ROCHESTER, N. Y.
ST. LOUIS, MO.
SALT LAKE CITY, UTAH
SAN ANTONIO, TEXAS
SAN FRANCISCO, CALIF.
SEATTLE, WASH.
SHREVEPORT, LA.
SOUTH BEND, IND.
SYRACUSE, N. Y.
TOLEDO, OHIO
TOPEKA, KAN.
TULSA, OKLA.
WASHINGTON, D. C.
WICHITA, KAN.

CLARAGE FAN COMPANY Kalamazoo, Mich.

CLARAGE ... *dependable equipment for making air your servant*

SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES • IN CANADA: Canada Fans, Ltd., 4285 Richelieu St., Montreal

The Paper Industry

Technology • Engineering • Management • Production

VOLUME 39 **NUMBER 12** **MARCH 1958**

Published monthly by:
FRITZ PUBLICATIONS, INC.
Edward B. Fritz (1869-1939), Founder

Publication Staff:

President and General Manager
A. SCOTT DOWD

Vice President and Treasurer
A. C. L. FRITZ

Secretary
A. C. BRUCE

Editorial Director
A. W. J. DYCK, Ph.D.

News Editor
D. W. ZEIGLER

Market Analyst
JEROME KASSIDAY

Advertising and Production Manager
CHARLES E. DOWD

Circulation Manager
JOHN H. REARDON

Assistant Circulation Manager
AUDREY CUSTER

Advertising Representatives:

CHICAGO 5: **Jack Henderson,** 431 South Dearborn Street, Wabash 2-3543

CLEVELAND 21: **Wm. W. Andrews,** 2620 Noble Road, Evergreen 2-1290 and Wyoming 1-7144

CINCINNATI 38: **Wm. W. Andrews,** 5822 Glenway, MOntana 1-7410

PITTSBURGH 17: **Wm. W. Andrews** (Robert Todd, Representative), 2242 Beechwood Blvd., Hazel 1-2974

EASTERN: **Jack Bain Company,** 545 Fifth Avenue, New York 17, N.Y. Murray Hill 2-3345

SOUTHEASTERN: **Fred W. Smith,** 1201 Forest View Lane — Vesthaven, Birmingham 9, Ala., Tremont 1-5762

WEST COAST: **Murray Bothwell,** 234 East Colorado St., Pasadena, Calif., Ryan 1-9155

THE PAPER INDUSTRY—founded in 1919—known as "The Paper Industry and Paper World" from June, 1939, through December, 1949, assumed its original title with the January, 1950 issue.

Published at 1501 Washington Road, Mendota, Illinois.

Address all correspondence to:
Fritz Publications, Inc.
431 South Dearborn Street
Chicago 5, Illinois

BPA

Member: Business Publications Audit of Circulation Inc.

Accepted as controlled circulation publication at Mendota, Ill.

Subscription rates: United States, U. S. Possessions and Canada $3.00 for one year. All other countries, $8.00 for one year, $18.00 for three years, payable in advance in U. S. Funds.

Features . . .

Editorial — Take another look at your communications 967

Whither? — Return to "normality" — Chip storage in outside piles — Latex-wax coating shows many exceptional properties — An adhesive in the form of a cord — Tests to predict package performance — Torula yeast used in baby foods ..1054

Economic impact of new processes on the pulp and paper industry 982
by Lee Eberhardt

St. Regis completes southern expansion — Part II 984

Problems of switchgear application in pulp and paper mills .. 991
by C. A. Fletchinger

Cold soda semichemical pulping — a discussion 994

43rd annual Tappi meeting 1001

Confidence in the future keynotes 81st APPA convention ...1007
by W. B. Bullock

APPA: the solid grounds for optimism 1008

Mead Research to install Beloit experimental unit 1019

Modern cookery comes to the man-in-the-woods 1020

$400,000 efficiency program outlined by Allied Paper Corp. .1021

Proposed merger of West Coast mills announced 1022

News . . .

News of the Industry 1019
Names in the News 1033
Necrology 1035

Departments . . .

Current Comments 1015
Coming Events 1031
Patent Reviews 1036
New Products 1039
New Literature 1047
Markets 1051
Foreign Abstracts 1052
Index to Advertisers 1053

The PAPER INDUSTRY is indexed regularly in **Engineering Index** and **Industrial Arts Index.** Index to Volume 39 will appear as a part of the April issue

© 1958 by Fritz Publications, Inc.

has proved successful
in solving
FOAM PROBLEMS
throughout the pulp
and paper mill

Information on request

R. T. VANDERBILT CO., INC.
230 Park Avenue, New York 17, N. Y.

From our point of view..

Take another look at your communications

The impact of the best intended communication suffers if the information contained in it is not clearly defined at the source, or if subsequently it is poorly portrayed by the disseminating medium.

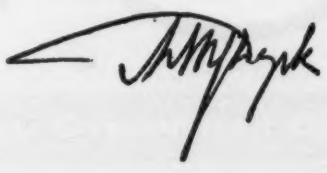
An industrial communications program in this science-minded world must therefore make sure that the responsibility for the dissemination of the company's information rests with a highly qualified group. One of the main qualifications here must be a background and training that will enable the communications center to cope with the vast technical detail that underlies most of the company's production and development operations. If the technical aspects of the company's activity are not sufficiently understood to interpret and identify their significance, the performance at the communication center cannot be at its best, with the consequence that the company interests are not promoted with the effectiveness needed for a full product, process and corporate identification.

With the growing complexity of a modern industrial establishment it is becoming increasingly important that the qualifications for key positions in the company's communication program—including advertising, public relations, technical information and inter-company communications—involve a proficiency in technical matters along with that of a cordial relationship with people and an understanding of the company's corporate structure.

An important aspect of an effective communications program also involves a direct association with the people at the source of research and new developments, where assistance is often needed in the preparation of more effective ways of describing new results and developments and presenting these to management and customers. This and the writing of special and interpretive progress reports for management, the preparation of process and product data for effective advertising and public relations programs and the compilation of data and procedures for research and engineering operations all require an exceedingly high degree of familiarity with both the company's technology and its corporate structure.

Where the responsibility of the company's communications center also extends to the (1) screening of the tremendous volume of the technical literature now at the disposal of every successful establishment, (2) evaluating its importance to the company's proj-

(Continued on page 1004)



BIG REASONS

WHY THE HURLETRON AUTOMATIC MOISTURE CONTROL

can do the needed job in your paper mill!!!

1958

MORE SALEABLE TONNAGE IS PRODUCED

Because of the Hurletron Automatic Moisture Control, waste is substantially cut, and your product has more moisture content. As a result, more paper is shipped from your machine room. At the same time, a higher moisture content, allows greater machine speed.

MOISTURE ACROSS THE SHEET CHARTED AUTOMATICALLY

Because of the continuous, visual charting of the Hurletron Automatic Moisture Control, operators know the magnitude and location of wet or dry streaks. Wet end adjustments by operators correct water removal to produce a level profile at the dry end.

PAPER QUALITY IS IMPROVED

Weight, strength, flexibility, coating, retention, finish, etc., become more uniform when moistures are held closely. Sheets of higher moisture contents absorb and lose moistures more evenly when humidity changes occur and are more stable. If sheets must be produced at low or high moistures, the Hurletron Automatic Moisture Control holds variations within plus or minus ¼ of 1% through a range of 2% to 15%.

SHEET MOISTURES ARE MEASURED TO PLUS OR MINUS .1 OF 1%

At a point two and one half feet from a reference dryer having a constant pressure of steam, sheet temperatures reveal precisely the amount of water remaining in the sheet. Evaporation causes cooling, and is directly affected by moisture content. The Hurletron Automatic Moisture Control thermocouples provide signals to indicate this moisture content.

AVERAGE MOISTURES ARE RAISED TO HIGHER PERCENTAGES

Oven tests have shown that the Hurletron Automatic Moisture Control has raised moistures as much as 1% to 2.5%, without peaks exceeding customer specifications. The resulting products are more uniform and contain the desired properties to better satisfy converting operations.

AUTOMATIC REGULATION OF STEAM PRESSURE

Using one of the Hurletron gauges full time, puts the drying process under constant control. Machine direction variations are held within plus or minus ¼ of 1%. With controlled profile, the entire sheet is held to these limits, automatically.

LESS RAW MATERIAL REQUIRED

A major paper mill presently using the Hurletron Automatic Moisture Control, cut their pulp content in a ton of their product by 1%. The saving was accomplished by increasing the moisture content by 1%.

WASTE IS REDUCED

The Hurletron Moisture Control reduces waste at start-ups, at order changes, and during a run. Sheet breaks often caused by moistures getting too low, and uniformity gained through the use of the Hurletron reduces breaks and prevents loss of machine time.

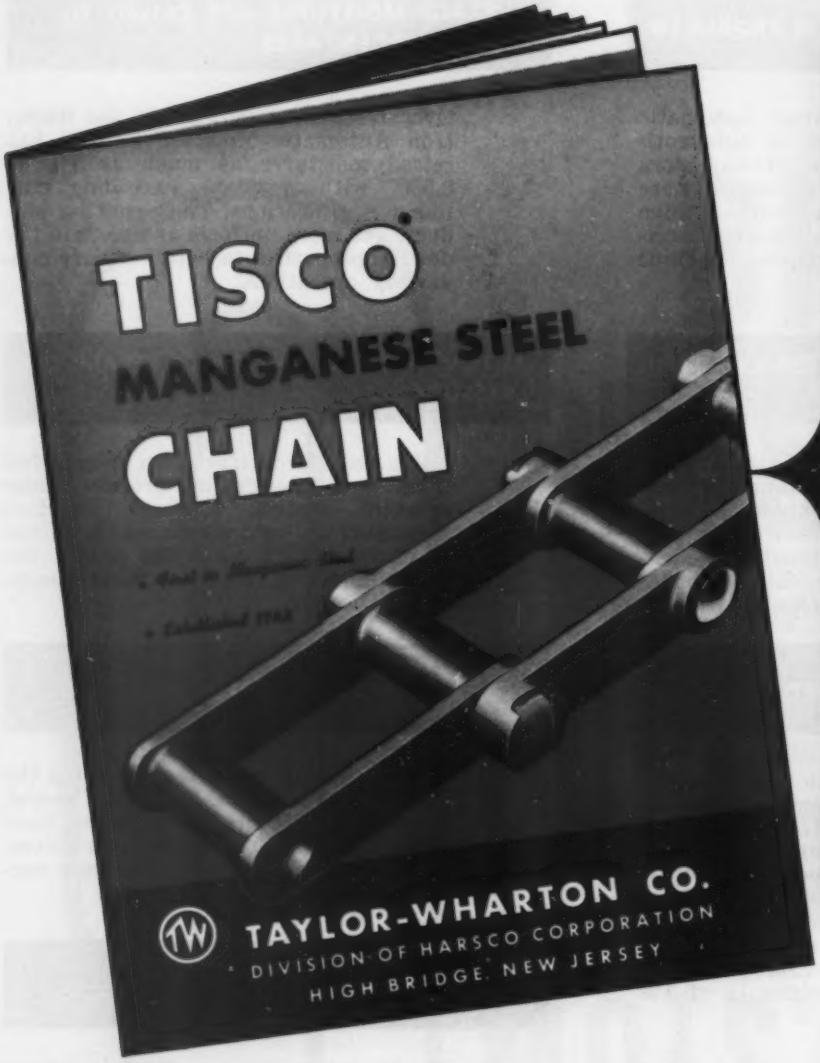
STEAM COSTS ARE REDUCED

When the Hurletron Automatic Moisture Control is in operation, 10% less steam is required, when sheet moisture is increased by 1%.

HURLETRON

Electric Eye Equipment Company

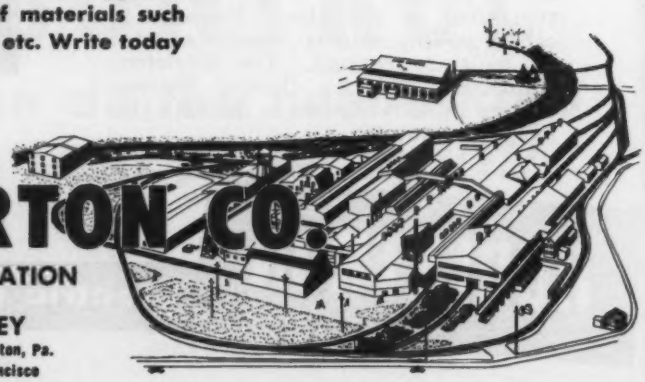
1930 EAST FAIRCHILD STREET, DANVILLE, ILLINOIS



16 PAGES PACKED FULL OF CHAIN DATA IT'S

Yours for the asking

TISCO Manganese Steel Chain has no rival for long wear and rough use. All popular sizes and types of chain are shown for handling of materials such as ores, sand, gravel, pulp wood, etc. Write today for this complete FREE Catalog.



TAYLOR-WHARTON CO.

DIVISION OF HARSCO CORPORATION
Established 1742
HIGH BRIDGE 5, NEW JERSEY
PLANTS: Cincinnati, O. — Birmingham, Ala. — Easton, Pa.
SALES OFFICES: New York — Chicago — San Francisco

THE BAUER BROS. CO.
1759 SHERIDAN AVE., SPRINGFIELD, OHIO

Send me the facts about automatic formation control.

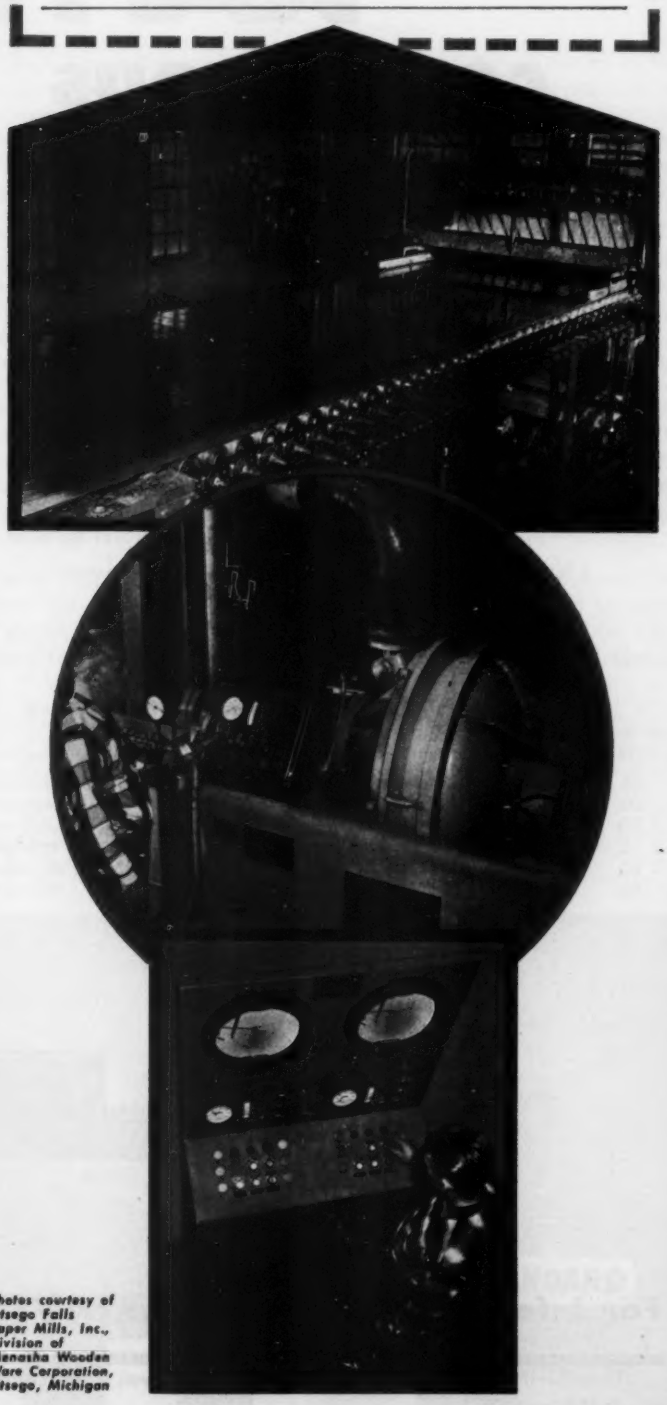
NAME_____

TITLE_____

ADDRESS_____

_____

Keep Your Best Formation on the Wire Automatically!



Bauer Pump Thru Refiner controlled by Couch Vacuum Does the Job

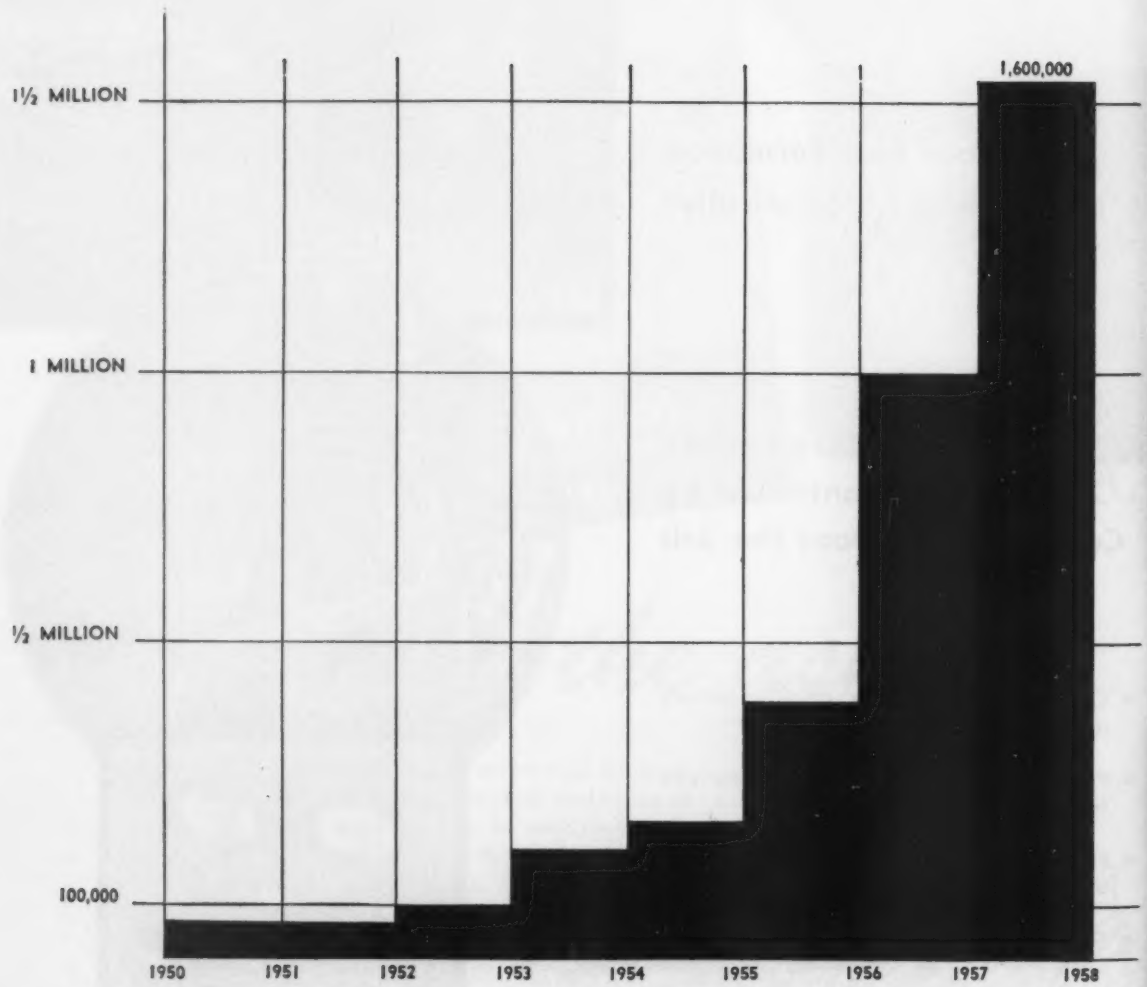
- Compensates for slight stock variations quicker than the best operators.
- Prevents over or under refining, corrects for hard or soft cooks.
- Has improved sheet formation within minutes after first start-up.
- Controls are simple, easy to maintain.

Write, wire or call for details.

Photos courtesy of Otsego Falls Paper Mills, Inc., Division of Menasha Wooden Ware Corporation, Otsego, Michigan

MORE THAN ONE AND A HALF MILLION TONS of High Strength Pulps per year with

KAMYR continuous digesters



For Information Contact KAMYR INC. Hudson Falls, N. Y.

West Coast Representative: A. H. Lundberg, Inc., Mercer, Wash.

They packed up turbine oil worries at Alton Box Board

six turbines use NONPAREIL Turbine Oil, have life-of-turbine guarantee

Six NONPAREIL Turbine Oil guarantee certificates on the turbine room wall are pointed out by M. D. Jones, Superintendent of the Power and Steam Department. Standard Oil Company's lubrication engineer, W. P. "Sandy" Wehking, helped put most of the certificates there.

Alton Box Board Company, Alton, Illinois, doesn't have a worry in the world about turbine oil. The Company has six turbines in service—four in the power plant and two in the paper mill—all using NONPAREIL Turbine Oil. Why no worries? Because each of these fills of turbine oil is *guaranteed for the life of the turbine* not to exceed a neutralization number above 0.15 mg. KOH/g.

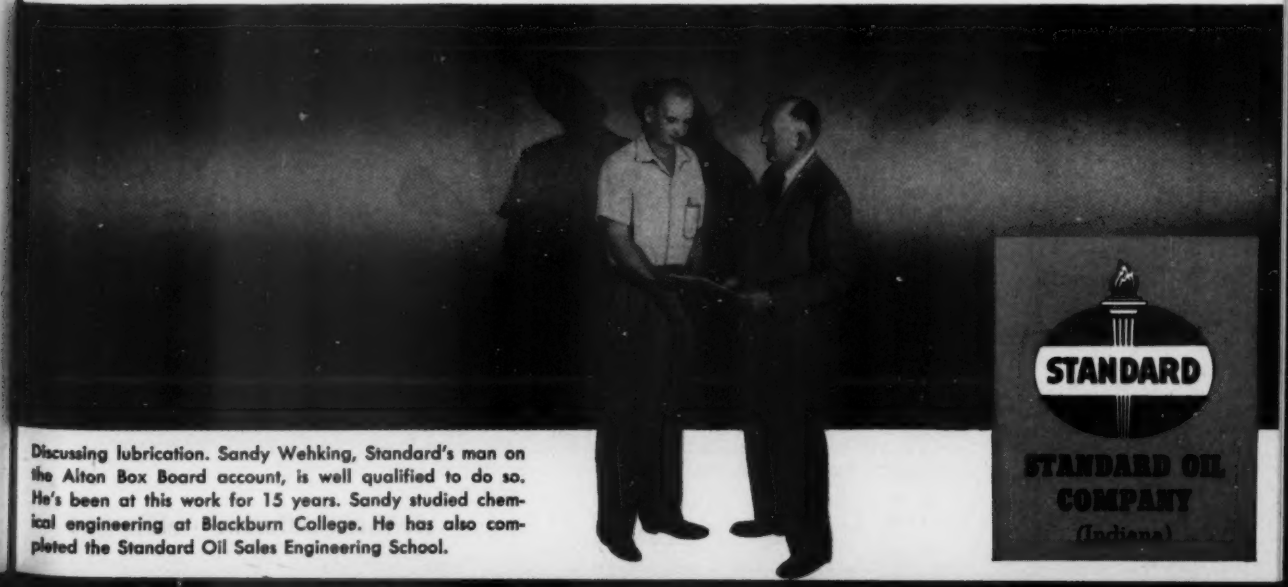
The five Westinghouse and one G-E turbine oil fills have demonstrated a remarkable low acidity record over the years. Regular inspection by Standard Oil technical service representatives and analysis of oil samples by the Standard Oil Research Laboratory, Whiting, Indiana, makes sure the oil is performing in accordance with the guarantee. At Alton Box, neutralization number of the oil has been running 0.02 to 0.03 mg. KOH/g.

This is what such service from a turbine oil means to Alton Box Board: They can run one of the largest board mills in the world without having to concern themselves with the performance of the turbine oil they are using. Standard Oil technical service men inspect the system. The oil is sampled and analyzed regularly. Plant operation will never be interrupted because of turbine oil lubrication failure.

The same performance from NONPAREIL Turbine Oil and service from Standard Oil awaits you. Find out. Call your nearby Standard Oil office near you in any of the 15 Midwest and Rocky Mountain states. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

How NONPAREIL Turbine Oil is performing at Alton Box Board

Make of Turbine	kw. (H.P.)	Year NONPAREIL Installed	Location	Gal. fill.	Neut. No. mg. KOH/g.
Westinghouse	1,500	1934	Power Plant	85	.02
Westinghouse	3,125	1936	Power Plant	275	.03
General Elec.	400	1936	Paper Mill	50	.02
Westinghouse	1,500	1941	Power Plant	250	.03
Westinghouse	5,000	1947	Power Plant	230	.03
Westinghouse	1,500	1947	Paper Mill	80	.02



Discussing lubrication. Sandy Wehking, Standard's man on the Alton Box Board account, is well qualified to do so. He's been at this work for 15 years. Sandy studied chemical engineering at Blackburn College. He has also completed the Standard Oil Sales Engineering School.

STANDARD

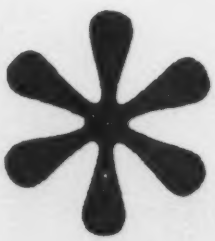
STANDARD OIL COMPANY (Indiana)

Now, Through Cyanamid Research...

You need 30% to 60% less Wet-Strength Resin with Cyanamid's

New **HE*** Process For Resin Economy!

...Available to all paper manufacturers



**HE high efficiency process for resin economy... patents applied for by American Cyanamid Company.*

Intensive field trials by Cyanamid have thoroughly proved that an average of 40% *less* wet-strength resin can produce papers fully equivalent in wet-strength properties. Not only does this new "HE" Process provide unprecedented reductions in resin costs, it also provides a means of producing "super" wet-strength papers with properties never before obtainable. Another benefit is the widened application range for melamine resins, permitting their use in many mills for the first time.

The new economies of this resin-saving process are available to all paper manufacturers. Full details on the new "HE" Process and its licensing can be provided by your nearest Cyanamid Paper Chemicals representative. An appointment will be made at your request.

ANOTHER EXAMPLE

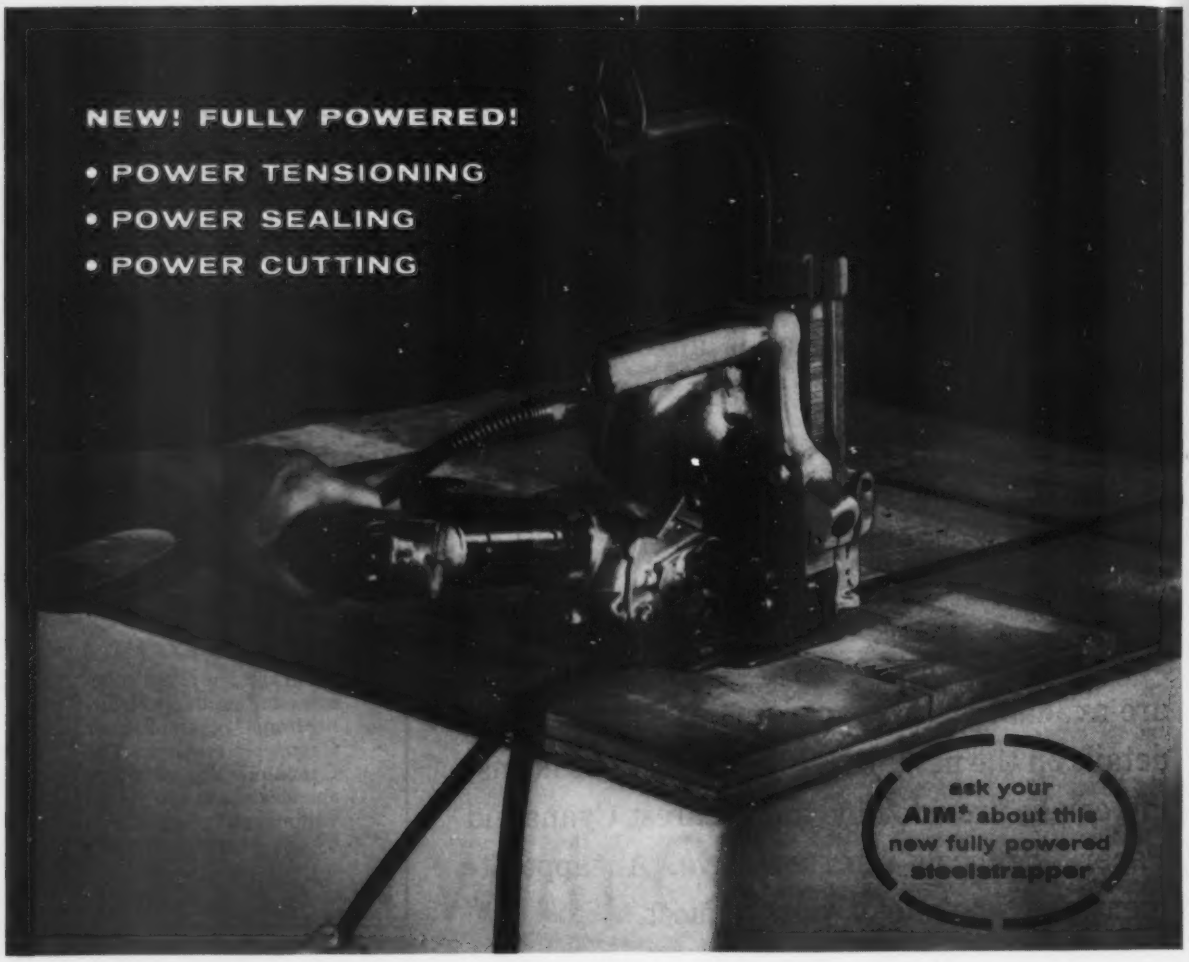
. . . of the improved processes and products resulting from Cyanamid Paper Chemicals research. The Cyanamid line of paper chemicals is the largest in volume and variety offered by any manufacturer.

CYANAMID

AMERICAN CYANAMID COMPANY

Paper Chemicals Department, 30 Rockefeller Plaza, New York 20, N. Y.

In Canada: North American Cyanamid Limited, Toronto and Montreal


NEW! FULLY POWERED!
• POWER TENSIONING
• POWER SEALING
• POWER CUTTING
ask your AIM* about this new fully powered steelstrapper

Announcing another Acme Steel first...

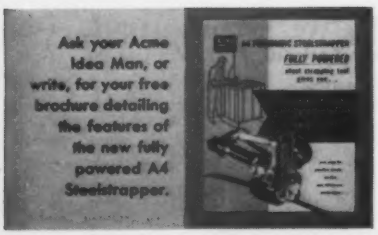
The new, fully powered A4 Steelstrapper

ACME STEEL COMPANY is first to offer industry a Steelstrapper that tensions, seals and cuts steel strapping automatically . . . all with air power. Called the A4 Pneumatic Steelstrapper, this new tool includes one-hand controls among its many features.

With steel strapping quickly and easily inserted, the operator merely presses a control on the handle to power-tighten strapping to predetermined tension. And then with another power control on the same handle, magazine-fed seals are applied and the steel strapping cut without waste or operator effort.

Your *Acme Idea Man can demonstrate the new A4 Pneumatic Steelstrapper and show you its many time, effort and money saving advantages. The first full-power tool of its kind, the new A4 Steelstrapper will give maximum performance in your steel strapping application.

Contact your Acme Idea Man at the nearest Acme Steel Company office. Or write: Dept. PKS-38, Acme Steel Products Division, Acme Steel Company, Chicago 27, Illinois. In Canada, Acme Steel Company of Canada, Ltd., 743 Warden Ave., Toronto 13, Ontario.


Ask your Acme Idea Man, or write, for your free brochure detailing the features of the new fully powered A4 Steelstrapper.
FULLY POWERED

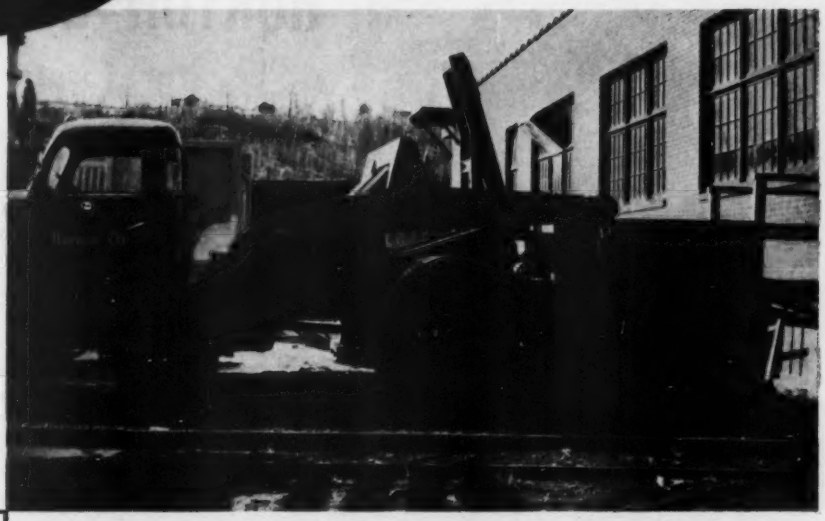
ACME STEEL **STEEL STRAPPING**

BROWN COMPANY

One of New England's Leading Pulp and Paper Producers. . .

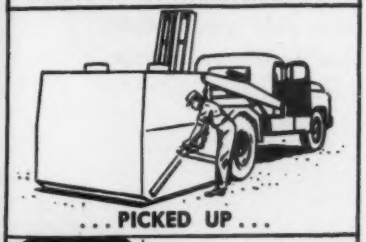
"CONTAINERIZES"

Waste as It Accumulates



New Hampshire Plant "Containerizes" Waste at 25 Accumulation Points —Dempster-Dumpster Picks Up and Dumps 120 cu. yds. of Waste per Day

WASTE IS CONTAINERIZED . . .



. . . PICKED UP . . .

. . . HAULED . . .

. . . AND DUMPED . . .

Dempster-Dumpster Disposal System Serves Leading Paper Manufacturers

Keeping a pulp or paper mill clean and free of fast-accumulating waste is a critical job . . . one that can't be economically handled by wheelbarrows, cans, bins or carts. Eliminate manual shoveling and rehandling as other industry leaders do by *"Containerizing"* waste as it accumulates. The secret lies in clean, big-capacity Dempster-Dumpster containers at principal points of waste accumulation, periodically picked-up, hauled and emptied by one man and one truck-mounted Dempster-Dumpster.

The savings are obvious . . . paper mills customarily amortizing their Dempster-Dumpster equipment investment in 18 months or less. If you're now using costly, obsolete methods of waste disposal, it will pay you to write for the booklet below.

FREE: Write Today for Your Copy of "How to Reduce Waste Disposal Costs"

DEMPSTER BROTHERS, Knoxville 17, Tenn., Dept. PI-3

THE DEMPSTER DUMPSTER® SYSTEM

To: Dempster Brothers, Dept. PI-3
Knoxville, Tennessee

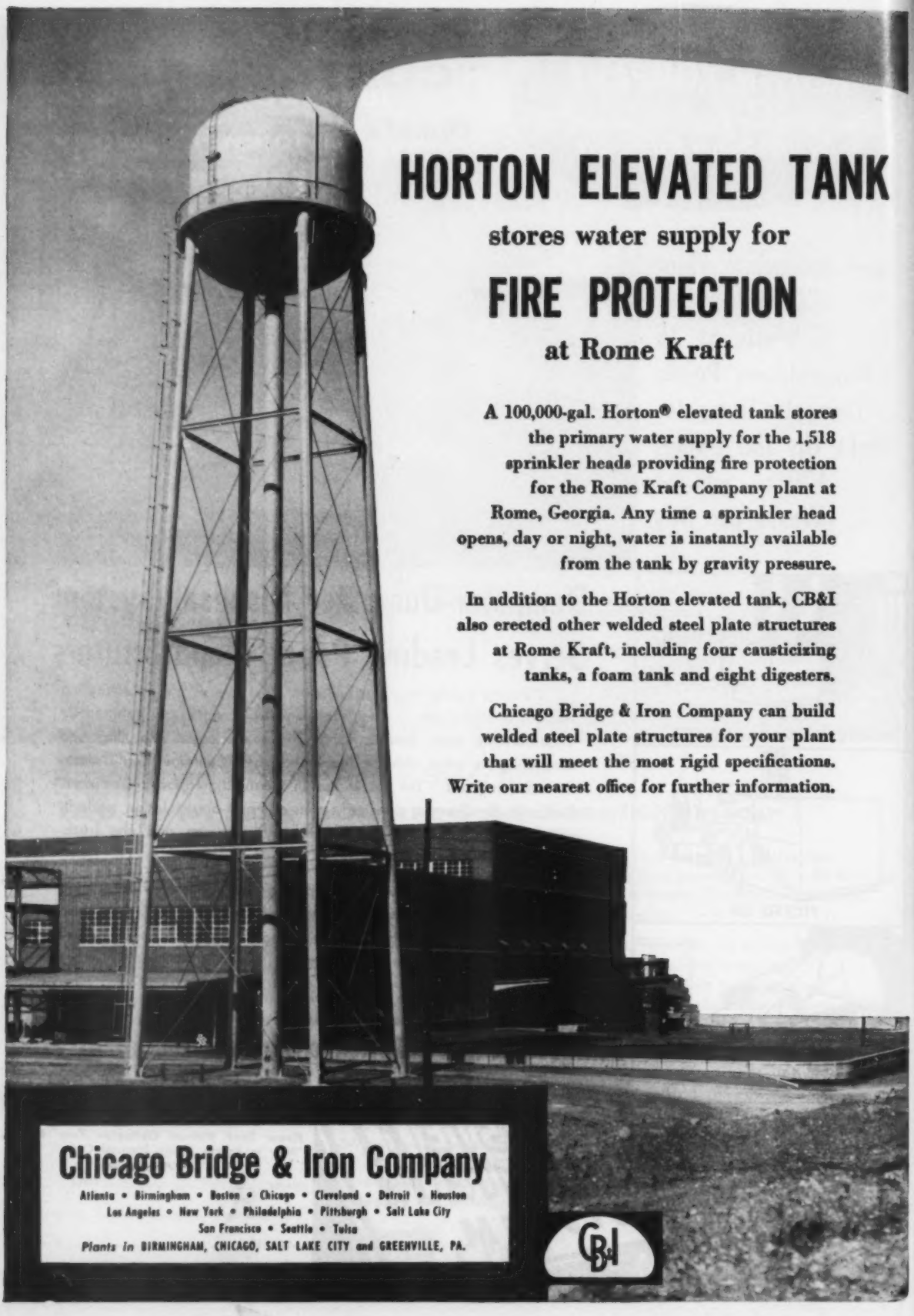
Please Send Without Obligation Your Booklet, "How to Reduce Waste Disposal Costs."

NAME ..... TITLE .....

COMPANY .....

ADDRESS .....

CITY ..... STATE .....



HORTON ELEVATED TANK

stores water supply for

FIRE PROTECTION

at Rome Kraft

A 100,000-gal. Horton® elevated tank stores the primary water supply for the 1,518 sprinkler heads providing fire protection for the Rome Kraft Company plant at Rome, Georgia. Any time a sprinkler head opens, day or night, water is instantly available from the tank by gravity pressure.

In addition to the Horton elevated tank, CB&I also erected other welded steel plate structures at Rome Kraft, including four causticizing tanks, a foam tank and eight digesters.

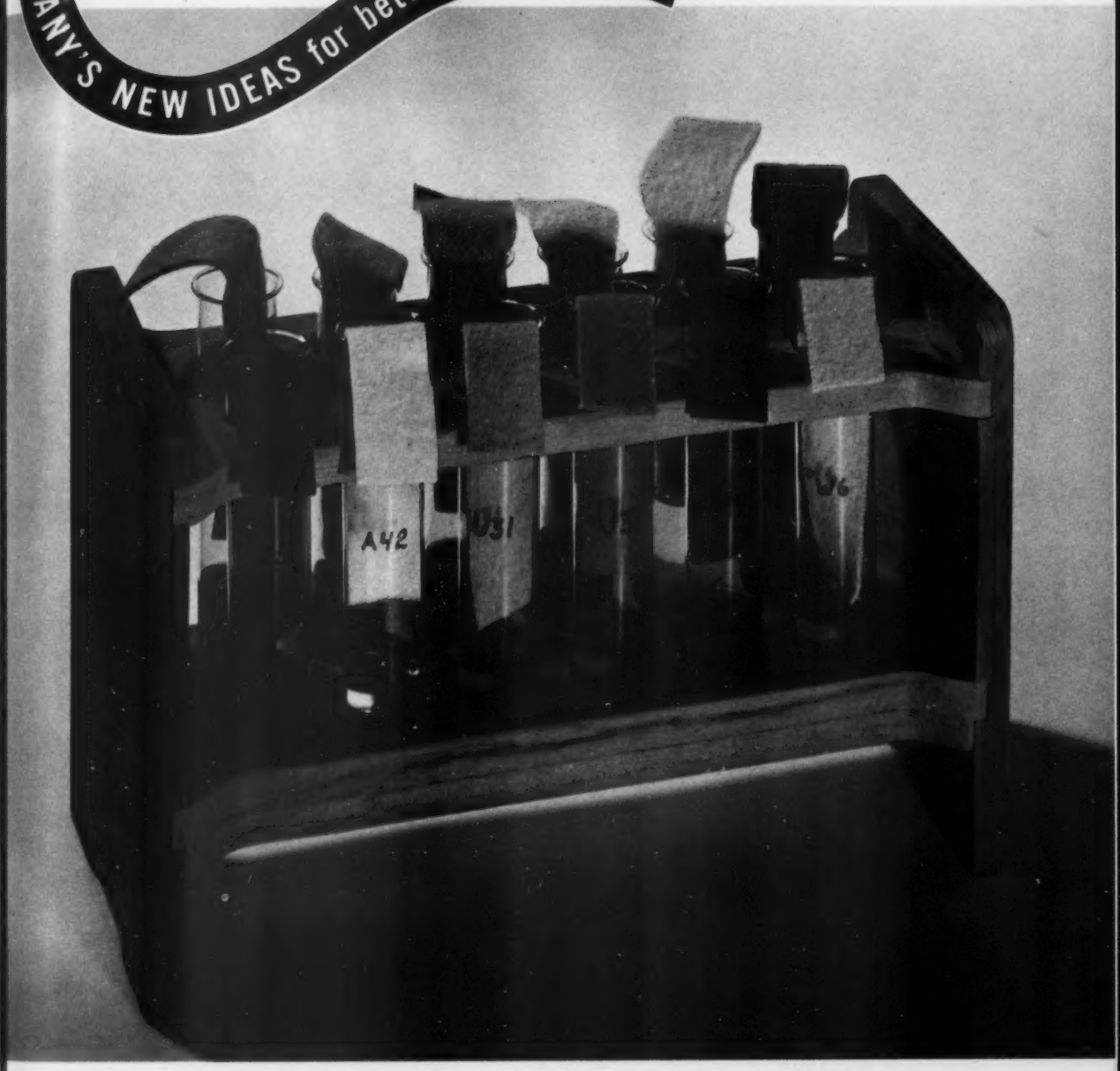
Chicago Bridge & Iron Company can build welded steel plate structures for your plant that will meet the most rigid specifications. Write our nearest office for further information.

Chicago Bridge & Iron Company

Atlanta • Birmingham • Boston • Chicago • Cleveland • Detroit • Houston
Los Angeles • New York • Philadelphia • Pittsburgh • Salt Lake City
San Francisco • Seattle • Tulsa
Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PA.

CBI

ALBANY'S NEW IDEAS for better papermaking



WHAT CHEMICAL TREATMENTS MEAN

Chemical treatments for paper machine felts, like the design of the felt itself, must be evolved for a specific task. For this reason, Albany research laboratories have carried on a continuous program of development of new treatments to improve felt performance. Today, Albany offers more than 20 specific-purpose treatments to papermakers, including those which inhibit bacterial growth; give resistance to wear and stretch; keep the felt soft and open; improve starting and wetting; help prevent chemical and alkaline damage; and many others. Of particular importance to the papermaker are the new colorless treatments recently developed by the Albany Felt research laboratory. These should prove to be of great advantage to those mills running critical grades where colored fibers might be noticeable. Our goal, as always, is to help you produce more saleable tons per day!

AF

ALBANY FELT COMPANY

MAIN OFFICE & PLANT, ALBANY, N.Y.

OTHER PLANTS: HOOSICK FALLS, N.Y.; N. MONMOUTH, ME.; ST. STEPHEN, S.C.; COWANSVILLE, P.Q.

"THE WORLD'S LARGEST MANUFACTURER OF PAPER MACHINE FELTS"

MicroRold®
STAINLESS
SHEET

Type 430 Bright Finish

up to 48" WIDE

BRIGHTER THAN EVER!—MicroRold stainless steel Type 430 in the NEW Bright Finish is now immediately available in sheets up to 48" wide offering new usefulness and economy in stainless fabrication. Produced with the same micro-accuracy of gauge for which MicroRold 36" is well known, Type 430 Bright up to 48" wide gives greater latitude in applications for quality stainless steel.

MicroRold 430 is also available in the regular commercial finishes and MicroRold stainless in other grades are now produced up to 48" wide. Complete details sent on request.

Washington Steel
Corporation
WOODLAND AVENUE WASHINGTON, PA.

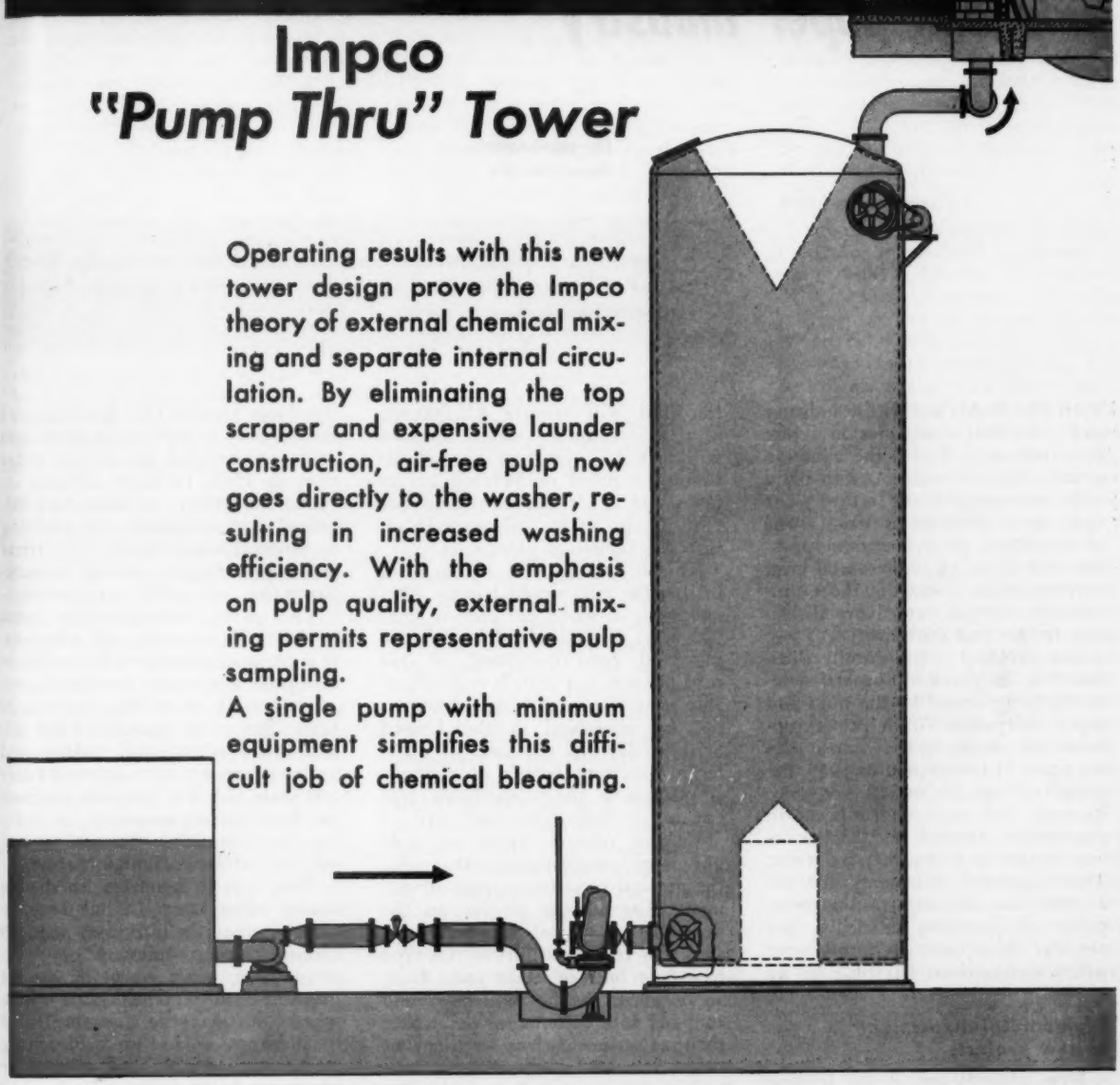
3 GG

the Modern Low Density Bleaching Technique

Impco
"Pump Thru" Tower

Operating results with this new tower design prove the Impco theory of external chemical mixing and separate internal circulation. By eliminating the top scraper and expensive launder construction, air-free pulp now goes directly to the washer, resulting in increased washing efficiency. With the emphasis on pulp quality, external mixing permits representative pulp sampling.

A single pump with minimum equipment simplifies this difficult job of chemical bleaching.



IMPCO®

IMPROVED MACHINERY INC.

NASHUA · NEW HAMPSHIRE

· In Canada, Sherbrooke Machineries Limited, Sherbrooke, Quebec

Feature articles

Economic impact of new processes on the pulp and paper industry*

LEE EBERHARDT
Bauer Bros. Co.

▶ The high capital investments required for new pulp and paper mills create a need for higher capacity equipment and new processes.

THE PULP AND PAPER industry and individual companies in it are at a crossroads. Today the situation is such that one must work to stand still and progress to survive. The short term situation is strictly one of economics, for the current problems are those of high capital cost, over-expansion, soft markets, increasing costs of raw materials, labor, freight and overhead.

The problem is graphically illustrated by the year-end financial statements being issued by the pulp and paper companies. With few exceptions the theme is the same: sales are equal or better than in 1956, net profit off 10, 15 or 25 per cent. Reasons: soft markets; cut-backs in production tonnage, and higher labor, freight and raw material costs. These financial statements are not a reflection on top management, policy or operating efficiency, but are due to economic factors over which management has little or no control.

High capital investment in new projects

New projects are at the highest daily ton capacity cost in history and must be paid for in a situation where the government takes 50 per cent in taxes out of a successful company's profits.

For example, at the present time it costs approximately $120,000 per daily ton capacity to build a modern integrated newsprint mill. A 600-ton unit will require $72,000,000 capital investment, which in turn will take 15.2 years to pay off assuming a profit of $45/ton before taxes and a 350-day operation per year. It also takes 2.64 years to return the capital as gross sales.

This is not the end of the road, in that the mill would require 250,000 cords of wood per year or 250,000 acres of timberland based on a sustained yield increment of one cord per acre per year. It is questionable if such a large block of timber can be assembled in the United States today. In the case of some recent southern timber acquisitions at $100/acre the timberlands cost equals 1/3 that of the pulp mill.

Risk or venture capital naturally gravitates toward projects that offer the greatest return on capital investment. The 15-year payout on the news mill is one of the major reasons why few new mills of this type have been built in recent years. Even an optimistic banker will clip bond coupons with little or no risk rather than invest in such long term payout projects.

Need for higher capacity equipment and new methods

In view of this situation, over-all capital requirements to build mills must be reduced. The pulp mill picture from tree to end product must be critically examined and new ideas, processes and techniques developed to reduce this basic problem of capital requirement.

A partial answer is higher-capacity equipment. For example, in 10 years the Bauer Double Disc has increased from a 300- to 800-hp machine, and cost per installed hp is less today than in 1948. In large refining installations fewer machines are required with reduction in building requirements and labor. The trend is toward bigger, better, maintenance-free automated equipment.

The paper industry takes great pride in its technological advances. It is no exaggeration to state that in the past five years we have progressed as far as in the previous 20 years. But is it enough? After all, the basic groundwood, sulfite and kraft processes are approximately 100 years old. The progress attained has been by improvement of existing processes and techniques and not due to fundamental changes.

This type of progress has had a drastic effect upon capital requirement in that the processes tend to become more complex. A good example is the achievement of 90-plus brightness in bleached kraft mills, where this has been accomplished by adding more and more bleaching stages until eight- and nine-stage plants are being utilized. Each additional stage requires approximately $500,000 investment capital. From the standpoint of capital investment simplification would appear to be in order.

In this same bleached kraft mill what do we do? We take a softwood that has a 50-55 per cent G.E. brightness in the stick, we cook it to less than 50-per cent yield and a brightness in the low 30s. Then after processing through three to four

*Paper presented during panel discussion at the Second Pulp and Paper Conference, Western Michigan University, Kalamazoo.

stages in the bleach plant, we finally are back where we started. We then require the additional stages to achieve the desired 90-plus brightness at final yield of less than 40 per cent based on wood.

Fundamentally, it appears the process is aimed at purification of cellulose and only incidentally at producing a white fibrous material adequate for end product quality in the paper machine reel. It would also appear that the entire situation is suspect, and drastic simplification accompanied by lowering of capital investment is required.

In this Sputnik age, "breakthrough" is a common household word. Aren't we overdue for more "breakthroughs" in the pulp and paper field? Witness the progress in aluminum, petrochemical and plastics. Whole new industries have risen in the past 25 years to compete with this industry in production, product development, pricing, sales and sales promotion. A visit to your local supermarket provides a graphic example of the fierce competition between glass, plastics, aluminum and paper products.

Wood costs

Wood is the basic raw material of the pulp and paper industry and one of the major economic factors in end product costs. At the present time the price level for peeled softwood pulpwood on the block pile varies widely in the geographic pulp producing regions. Approximate relative per unit figures are as follows: $18 in the South, $22 in the Pacific Northwest, $35 in the Lake States, and $45 to $55 in the Northeast and eastern Canada. In most cases hardwoods are somewhat lower in cost.

The above costs depend primarily upon factors of accessibility, labor, transportation and stumpage costs, yield per acre and annual growth increment. Of these factors all but the last two are due to demand, economic and political aspects. The last two factors are dependent upon forest genetics and forest management, both of which are in a relatively primitive state of development.

Woods operations

Woods operations vary widely; perhaps the two extremes are illustrated by the following cases in operation today.

Case I—Canada. An operation in the St. James Bay watershed is operated from bush camps. The pulpwood is cut and hand-peeled during the winter and driven down a river. It is then boomed, transported over the height of land and dumped into a second river in the St. Lawrence River watershed. The pulpwood is boomed at the river mouth on the St. Lawrence and finally loaded on river boat for delivery to the mill at a cost in excess of $50 per cord.

Companies confronted with this type of wood procurement are in an almost critical if not hopeless situation. Woods labor is reluctant to live and work under remote bush camp conditions, mechanization is difficult, sinkage loss is expensive, and in some cases it is two years from the time the tree is cut until the wood is delivered to the mill blockpile. The inventory problems are difficult, and working capital is tied up floating down a river. After all, 200,000 cords of wood at $50 represents $10,000,000 of non-working capital.

Case II—Pacific Northwest. In this case the operation is on lodgepole pine growing on mountainous terrain. A scissors-equipped bulldozer cuts a swath through the stand. The stems, 10 to 15 at a time, are fairleaded into a modified logging arch, and a bulldozer drags them to the landing.

At the landing the whole trees are fed butt first into a horizontal feed chipper, which in turn loads to a 2800-cu. ft. trailer, three of which are shuttled by tractors 75 to 90 miles to the pulp mill. At the mill the trailers are upend-dumped and the chips handled into the mill or chip pile. The bark is removed in the screening operation. This "Blood, Guts and Feathers" technique, run by independent operators, delivers the chips at a total cost of less than $15 per unit. This is the lowest cost production from timberlands we have ever encountered.

The chainsaw was a breakthrough in the woods. Perhaps the idea will provide the nucleus of another.

Wood-handling

A stick of pulpwood is about as miserable an item to handle as you will ever encounter. Hand labor, machine labor and capital are expended freely all the way from the tree to the chipper. It appears that the logical solution to the pulpwood-handling situation is to convert into chips as early in the process as possible.

Petroleum products are being piped from Alberta to Montreal, and Texas to New England. In Ohio they are pumping coal from southern Ohio to Cleveland; could not similar methods be utilized on finely divided wood in a fluid medium of water or air?

Chips are being stored in outdoor piles in most of the West Coast mills, and their chip-handling systems as installed are very practical, inexpensive and efficient. Many of these same ideas can be applied to eastern and northern conditions.

Someone will probably say, "Well, what do you do under severe snow and cold climatic conditions?" We know chips in a pile will not freeze down more than a few inches due to their insulating nature, and if it is feasible to put a plastic impregnated nylon cover over football fields, could not the same technique be applied to piles of chips under northern conditions?

Pulping methods

The continuous digester is rapidly becoming an accepted instrument in pulp mill operations. We believe that a fully-automated continuous pulping process for all pulp grades is very near. New techniques, higher pressures, better impregnation, better corrosion resistance, lower maintenance charges and greater versatility, control and uniformity of end product quality are in the offing. These developments will provide a substantial labor saving per ton of end product and offer the possibility of decreased capital requirement.

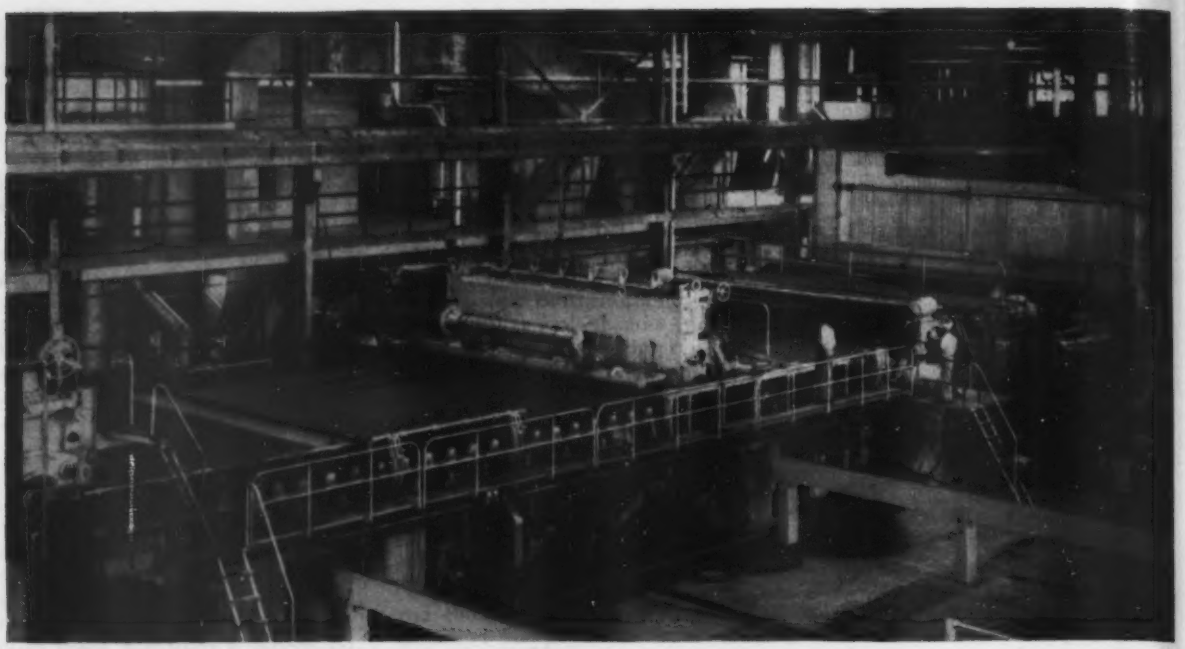
Press washing is rapidly developing and has appeal as offering possibility of lower capital investment and better chance of automation than low-density systems. Greater capacity per unit, better efficiency and better mechanical performance problems are being solved quite rapidly. The new Bauer Pressafiner and allied equipment being developed are providing excellent results.

Refining is becoming more of a factor in the pulp mill, as there is a trend toward higher yields in the conventional processes and the necessity of more power application in semichemical, cold soda pulping, and the groundwood-from-chips concept.

Screening and pulp cleaning with Bauer Cleaners and screen combinations have made the flat screens obsolete and greatly reduced wood room operations. The cleaners have also provided a means of removal of bark and shive dirt, heretofore not possible to obtain.

The combination of the above types of equipment makes possible the fully-automated, readily-expandable, low-capital-cost pulp mill. Using this equipment, it is also possible to consider moving the pulp mill to the wood source for partial

(Continued on page 996)



View of the Beloit fourdrinier with 276-in. wire and Valley Iron Works secondary headbox.

St. Regis completes southern expansion

Part II — The Beloit board machine, chemical recovery, finishing, water supply, steam and power

▶ The 2500-fpm Beloit board machine with a 1000-ton daily capacity is one of the largest and most modern paper machines in the South.

FOLLOWING the description of wood-handling, chip preparation, digestion, brown stock washing and stock preparation in Part I of the February issue, we are continuing with the description of the paper machine itself—one of the most modern in this country—and other auxiliary operations.

Paper machine

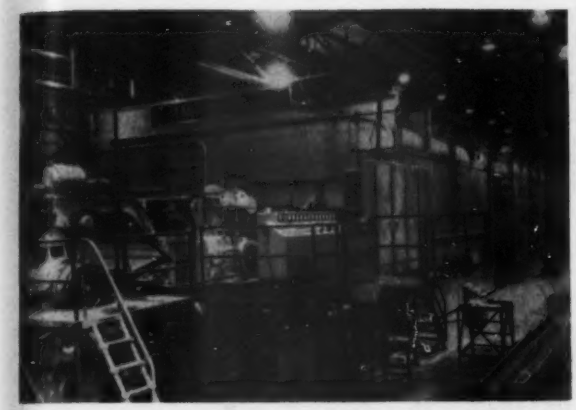
The paper machine, a left-hand fourdrinier with a 276-in. wide wire, is designed for making linerboard in grades from 38 lb. to 69 lb. per 1000 sq. ft. at speeds up to 2500 fpm.

Stock flows from the machine chests through consistency regulators that act as stuff boxes. From these consistency regulators stock is pumped by a 50,000-gpm 36-in. Class AFV fan pump that is driven by a 1000-hp synchronous motor to the primary headbox and by a 10,000-gpm 16-in. AFV fan pump driven by a 250-hp induction motor to the secondary headbox. Both pumps are the single-stage double suction type, horizontally split.

Prior to entering the pressure headbox, which is equipped with two stainless steel headless rectifier rolls, stock passes through a patented cross-flow distributor and through a stainless steel rising chamber and stainless steel headless rectifier roll.

The breast roll of the fourdrinier is 38-in. in diameter, and the forming board is made of stainless steel with Panelyte blades and mountings. The aluminum table rolls are covered with hard rubber and have stainless deflectors. There are 12 stainless steel suction boxes 15 in. wide with end outlets and sloping bottoms. The six wet suction boxes have Panelyte covers with slanting holes, and the six dry boxes are equipped with wax-impregnated end-of-grain maple covers. The 54-in. diameter couch roll is made of bronze and provides a 20-in. wide suction area.

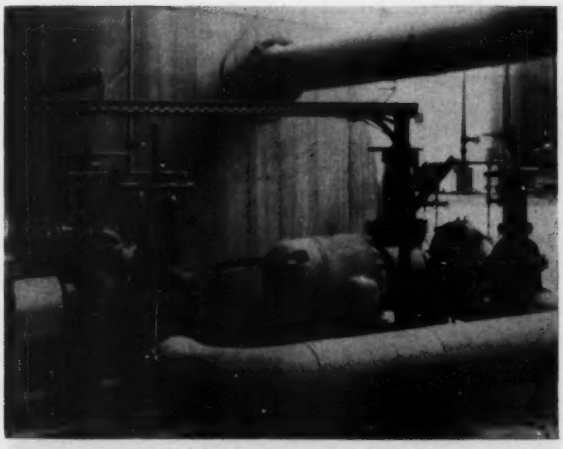
The wire is driven by a 38-in. diameter bronze turning roll. The



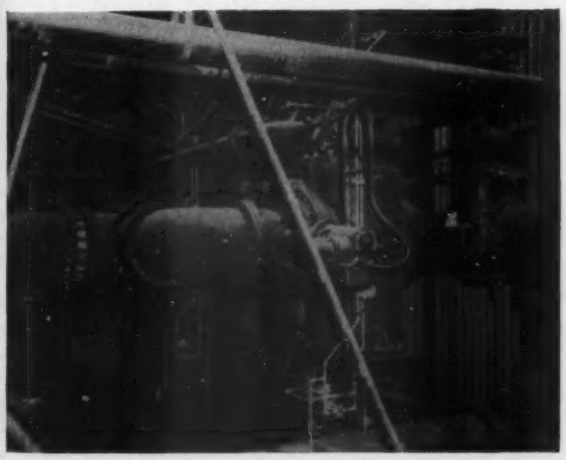
Beloit press section and Ross all-enclosed hood over dryer section.

Beloit calender and Ross hood over dryer sections.

Goslin-Birmingham sextuple-effect black liquor evaporators are arranged in two lines.

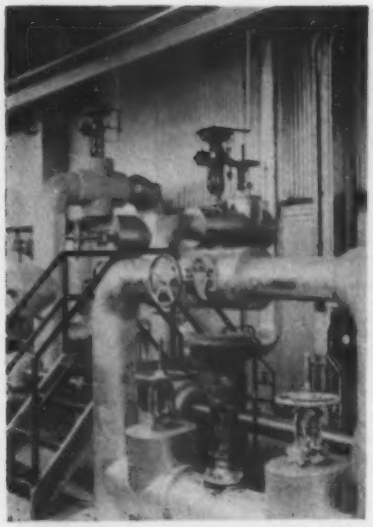


Two Goulds 10 × 12 — 14 double suction 2000-gpm pumps handling black liquor from foam tank to storage.

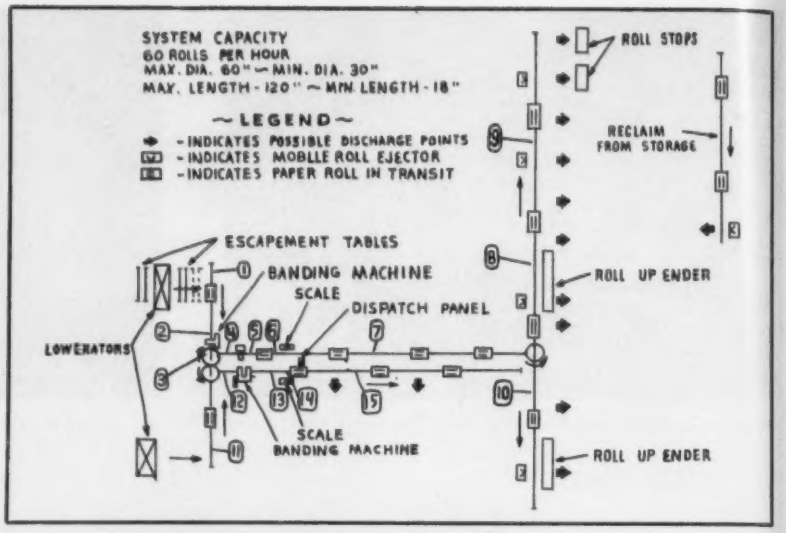


Elliott 20-in. back-flushing strainers serve the condensers on evaporators.

View of Bailey Meter control panels controlling black liquor evaporation.

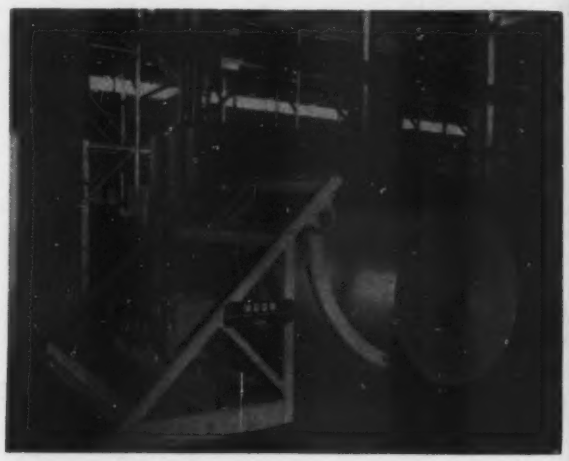


Fisher Governor diaphragm control valves on steam lines.



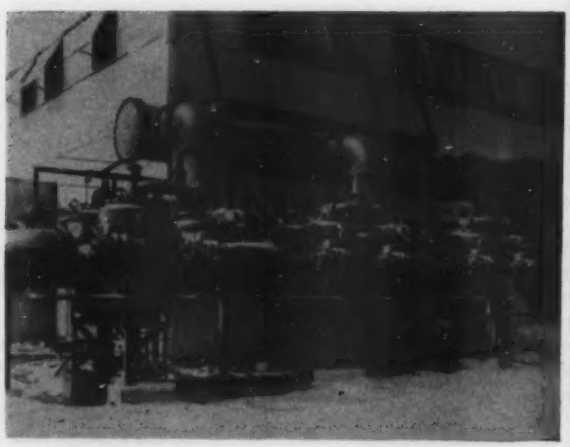
Diagrammatic presentation of Jervis B. Webb roll-handling system.

Jervis B. Webb roll-handling system—automatic transfer between conveyors via two turntables.



Jervis B. Webb roll-handling system—automatic transfer from slat conveyor to roll upender.

G. E. 30,000-kw hydrogen-cooled turbo-generator.



Three Elliott 24-in. back-flushing type strainers serving water condenser.

high-speed shake consists of multiple units driven by a variable-speed dc motor, each unit separately adjustable while operating.

The 32-in. diameter open-end dandy roll is spirally covered with monel wire. The 34-in. diameter lump breaker, equipped with diaphragm loading device, has a 2-in. thick soft neoprene covering.

A full-pressure stainless steel secondary inlet-headbox combination is designed to apply an overlay to the primary sheet amounting to approximately 10-25 per cent of the weight of the base sheet.

The wire pit is arranged to give a maximum stilling effect for release of excess air. The pit is of unusually deep design, and suction inlets for the primary and secondary fan pumps are separated from the incoming white water at the saveall pans and from the seal pits by a longitudinal dam on either side of the wire pit. This causes the white water to take paths the length of the fourdrinier and return under a dam through a central channel the length of the fourdrinier to the pump inlets.

The wet press section is of the vertical straight-through type, consisting of two presses. Each press has a 44-in. diameter rubber-covered suction bottom roll and a 42-in. diameter rubber-covered top roll. The top rolls are carried on swing arms with pivot parts and feature air loading equipment for applying and regulating nip pressures. All suction rolls are drilled with a spiral pattern to reduce the noise level.

The third press is a hot press, vertically arranged, with a 44-in. diameter rubber-covered suction roll and stainless steel core. The rubber-covered 42-in. diameter top roll is carried on swing arms with pivot parts and necessary air loading equipment for applying and regulating nip pressure.

Couch roll vacuum is supplied by three RCV-2 size 22×55−18×42 compound vacuum pumps, which provide a vacuum of 20-in. Hg and handle 39,150 cfm of air. The vacuum in the first press is supplied by a RCV-2 size 18×42−16×27 compound vacuum pump, while the second and third presses are served by two RCV 16 × 56 vacuum pumps. The suction boxes are served by a RCV 18 × 42 and the felt conditioners by one RCV 12 × 20 vacuum pump.

The dryer section consists of 97 paper dryers and 26 felt dryers of 60-in. diameter and arranged in six sections. All dryers are for operation at 125 psi. They are provided with high-speed condensate removers and duplex steam fits, steam and condensate connections to and from each steam fit featuring flexible joints and sight-flow. All felt dryers and rolls are mounted in anti-friction bearings and are driven by the felt. A size press consisting of two 42-in. diameter rubber-covered rolls is located between the fifth and sixth dryer sections.

The steam control and condensate removal system incorporates recirculating steam thermo-compressors to provide independent control of the various dryer sections and maintain adequate drainage differentials regardless of condensing loads on the dryers. The system utilizes full instrumentation to provide accurate control of drying temperatures and also incorporates a special break control to conserve steam during periods of breaks.

Following the dryer section there are two open-side calender stacks with Farreloy rolls. King rolls are 40-in. diameter, queen rolls are 24-in. diameter, and intermediate rolls are 18-in. diameter. The rolls on the calender stacks are provided with air-loaded doctors, and each stack is provided with electric motor-operated roll lifts.

Between the two stacks are four 60-in. diameter calender dryers for operation at 125 psi.

The reel is a heavy-duty reel with a 48-in. diameter constant-speed drum. The reel is equipped with brake for stopping full reels. The brake consists of palms and air cylinder for placing pressure on the ends of the rolls.

The extra heavy-duty Model L winder is designed for maximum speed of 6500 fpm. It has two winder drums of 24-in. diameter equipped with individual driving motors. It is also equipped with motor-driven shear-type backslitters, rider roll lift, roll ejector and shaft puller.

A circulating oil system, complete with roll-type filter, tanks, pumps and regulating equipment installed on the ground floor, provides lubrication to all rolls in the dryer section through oil side feeds.

A 260-in. diameter broke Hydrapulper, equipped with a 96-in. diameter rotor, is located directly beneath the calender and after-dryer section. This is the largest Hydrapulper in operation. It receives broke from the last pulp dryer, first calender, second calender, reel and the rewinder. The Hydrapulper has a capacity of 2000 cu. ft. It is equipped with an automatic system for consistency and water control and does not require operator attention during normal broke or trim operations.

Air system

The totally-enclosed machine hood, 360 ft. long including openings at the hot press and breaker stack, is of insulated aluminum panel construction on the top and corrugated aluminum panels in front and back side enclosures.

The lower panels on the tending side can be opened either manually or automatically on a paper break. On a paper break all supply fans have an automatic damper for by-passing air around the heater units to insure personnel comfort while working under the hood.

On the hood exhaust are ten 72-in. fans of the Axiflow type, and supplying air to the hood enclosures are 11 silent-vane fans. All supply fans are equipped with multi-duty air filters.

There are also two bottom felt supply units, a calender hood and exhaust, three heating and ventilating units, two summer ventilating units, two Ross Grewin systems, calender cooling system, trim conveying system, winder slitter, dust removal system, drying control room and winder motor ventilation, unit substation ventilation, wet end motor ventilation, finishing room ventilation, two machine room exhaust fans and two wet end exhaust fans.

In addition there are three brown stock washer hoods and exhausts, ventilating system for washer and decker drive motors, washer console panels, ventilation for water treatment laboratories, screen control panels, kiln feed and firing house control rooms and nine substation and control room systems.

Paper machine drives

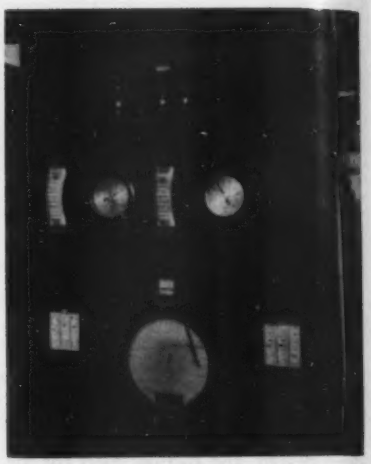
The paper machine is driven by a differential-type mechanical drive with separate differential gear units at the turning roll, first press, second press, hot press, size press, each of the six dryer sections, two calenders and reel. The differential units are driven by a line shaft operating at 1000 fpm. Power for the line shaft is furnished by a 3600-hp multi-valve, multi-stage, non-condensing turbine operating with 600-psi throttle pressure and discharging to the 170-psi system.

Each differential unit is supplied with power indicator units, air-operated clutches, transfer cases and inshaft. A slack take-up drive is installed on the calenders and reel.

In addition to the differential drive, variable-speed dc helper drives are installed on the dandy roll, lump breaker, 54-in. couch, turning roll, three wire return rolls, first and second presses, hot press, size press and on the calender dryers.

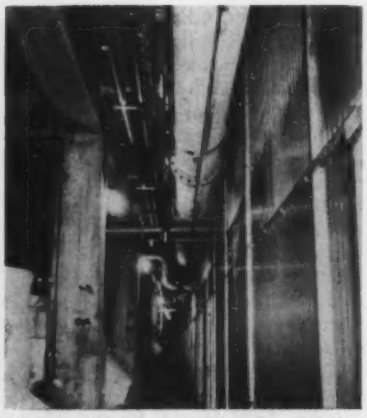
C. H. Wheeler 2000-gpm pump circulating water to turbine condenser.

Yarway impulse steam trap and strainer on condensate blow-off.

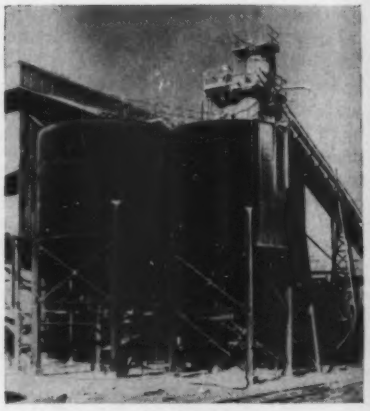


Yarway remote liquid level indicators used on boilers and feedwater heater.

Gruendler bark hogs.

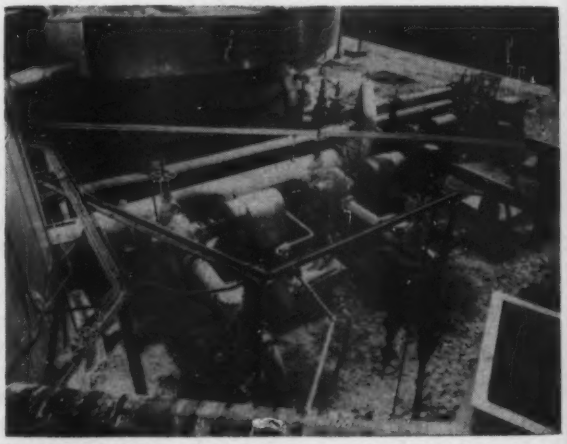


Johns-Manville Transite pipe from Hydrapulper to broke storage.



Gruendler lime crusher.

Graver water treatment system and storage tank.



Four Goulds 14-in. L double-suction pumps on mill water supply.

Principal equipment installed at the St. Regis Jacksonville mill

Paper machine

Air system, consisting of totally-enclosed machine hood (the largest in the world), brown stock washer hoods, motor ventilation, room ventilation, trim conveying, Ross-Grewin systems, calender cooling system, etc. ..... J. O. Ross Engineering Corp.
Calender stacks (2), open side with Farreloy rolls ..... Beloit Iron Works
Condensate remover and duplex steamfits ..... Beloit Iron Works
Couch roll (1), 54-in. diameter with 20-in. wide suction area ..... Beloit Iron Works
Crane (1), 60-ton capacity, twin-box girder design ..... Ederer Engineering Co.
Cross-flow distributor ..... Beloit Iron Works
Dandy roll (1), spirally-covered with Monel wire .. Beloit Iron Works
Fan pumps (2), one 50,000-gpm and one 10,000-gpm, driven by G.E. 1000-hp and 250-hp respectively ..... Ingersoll-Rand Co.
Fast's couplings, self-aligning ..... Koppers Co. Inc.
Forced-vapor circulating and heating systems ..... Ross Midwest Fulton Corp.
Fourdrinier (1), removable, 276-in. wire, with 12 stainless steel suction boxes ..... Beloit Iron Works
Headbox, primary (1), equipped with two stainless steel headless rectifier rolls ..... Beloit Iron Works
Hydrapulper (1), 260-in., equipped with 96-in. diameter rotor, and automatic system for consistency and water control ..... Black-Clawson Co.
Inlet headbox, secondary (1), stainless steel .... Valley Iron Works Co.
Dryer section, 97 cylinders of 60-in. diameter ..... Beloit Iron Works
Drying control, 1st, 2nd, 3rd and 5th sections ..... Foxboro Co.
Drying control, 4th and 6th sections ..... Stamm Drying Controls
Lumpbreaker roll (1), 34-in. diameter, neoprene-covered ..... Beloit Iron Works
Motors, electric, helper drives ..... General Electric Co.
Oil system ..... Beloit Iron Works
Paper machine drive, differential-type mechanical, driven by a 3600-hp G. E. turbine ..... Beloit Iron Works
Presses (3), two wet presses and one hot press, 44-in. diameter rubber-covered suction rolls and 42-in. diameter rubber-covered top rolls ..... Beloit Iron Works
Pumps, stock ..... Allis-Chalmers Mfg. Co.
Pumps, stock ..... Ingersoll-Rand Co.
Pumps, white and fresh water ..... Goulds Pumps Inc.
Reel (1), with 48-in. diameter constant-speed drum ..... Beloit Iron Works
Saveall (1), stainless steel ..... Beloit Iron Works
Size press (1), with two 42-in. diameter rubber-covered rolls ..... Beloit Iron Works
Steam control and condensate removal system ..... Ross Midwest Fulton Corp.
Transite pressure pipe, from Hydrapulper to broke storage and from saveall chest to wire pit ..... Johns-Manville Sales Corp.
Vacuum pump (1), L-4, for headbox system .... Nash Engineering Co.
Vacuum pumps (7), for couch suction boxes and presses ..... Roots-Connersville Blower Div.
Vickery felt conditioner (1), with four jordan type shoes ..... Bird Machine Co.
Winder (1), Model L, 6500-fpm, with two 24-in. diameter drums individually driven by G. E. motors ..... Beloit Iron Works

Chemical Recovery

Airveyor system ..... Fuller Co.
Cascade evaporators ..... D. J. Murray Mfg. Co.
Evaporators (12), arranged in two lines, sextuple-effect ..... Goslin-Birmingham Mfg. Co.
Fans ..... Buffalo Forge Co.
Gas scrubbers ..... Peabody Engineering Corp.
Instrumentation and automatic control on recovery boilers, black liquor flow, air flow ratio and cascade evaporator density ..... Bailey Meter Co.
Lime conveyors ..... Chain Belt Co.
Lime Kilns (2), 9 × 250 ft. ..... Traylor Engineering & Mfg. Co.
Lime slaker (1), rotary type ..... Allis-Chalmers Mfg. Co.
Precipitators (2), electrostatic ..... Koppers Co. Inc.
Pumps, black liquor ..... Worthington Corp.
Pumps, booster ..... Goulds Pumps Inc.
Pumps (3), two Model LQ212 and one Model 381 for handling soap skimmings ..... Viking Pump Co.
Pumps (8), 5 type W and 3 V-type, on recausticizing system ..... Dorr-Oliver Inc.
Recovery boilers (2), 180,000 lb. steam/hr each, 625 psi, 750° F ..... Combustion Engineering Inc.
Recausticizing system, consisting of 4 causticizer tanks, 1 white liquor tank, 1 two-stage lime mud washer tank, 2 lime mud storage tanks, 1 green liquor clarifier tank, 1 dregs washer tank, etc. ..... Dorr-Oliver Inc.
Slaker, rotary, 7 × 50 ft., self-classifying type ..... Allis-Chalmers Mfg. Co.
Strainers, 20-in. back-flushing type, for cooling condensers on evaporators ..... Elliott Co.
Valves, Nordstrom (194) ..... Rockwell Mfg. Co.

Steam and electric power

Air ejector, on surface condenser ..... Westinghouse Electric Corp.
Ash-handling and fly ash reinjection system .... United Conveyor Corp.
Bark-burning boiler (1), 135,000 lbs/hr capacity, equipped with Bailey instrumentation .. Combustion Engineering Inc.
Blowdown system, continuous ..... Cochrane Corp.
Boilers (2), power, "VU 50B" design, 200,000 lbs/hr each ..... Combustion Engineering Inc.
Boiler feed pumps (3), type 6HMTA5 ..... Ingersoll-Rand Co.
Chemical feed system ..... Milton Roy Co.
Combustion control on boilers ..... Bailey Meter Co.
Condensate pumps, vertical on surface condenser ..... Westinghouse Electric Corp.
Dust collector (1), for fly ash, multi-clone type ..... Western Precipitation Corp.
Deaerator, vertical tray type ..... Cochrane Corp.
Feed pumps (7), controlled-volume simplex type, for metering sodium sulfite, antifoam chemicals, monosodium phosphates and disodium hexameta phosphate ..... Milton Roy Co.
Feed water heater, high pressure ..... Foster Wheeler Corp.
Fuel oil heaters (3), discharge oil at a temperature of 225° F ..... Peabody Engineering Co.
Fuel oil pumps, 100 gpm ..... Peabody Engineering Co.
Instrumentation ..... Bailey Meter Co.
Oxygen and combustibles analyzer on power boilers ..... Bailey Meter Co.
Pumps (2), 2000 gpm; stainless steel impellers, shafts and wearing rings; driven by 350-hp G.E. motors; for circulating water supply to turbine condenser and barometric condensers on evaporators ..... C. H. Wheeler Mfg. Co.
Recovery boilers (2), 180,000 lbs/hr each ..... Combustion Engineering Inc.
Strainers, 24-in. back-flushing type for salt water cooling of surface condenser ..... Elliott Co.
Surface condenser (1), two-pass 19,000-sq. ft. ..... Westinghouse Electric Corp.
Turbo-generator (1), hydrogen-cooled, 30,000 kw, with automatic-controlled extraction at 165 psi and 65 psi ..... General Electric Co.
Valves, Nordstrom (48) ..... Rockwell Mfg. Co.

Water supply

Accelerator units (3), 8,750-gpm capacity each ..... Infilco Inc.
Cathodic protection for accelerators ..... Electric Rust-Proofing Co.
Flow meters and proportioning equipment ..... Infilco Inc.
Hot process lime and ion exchange system, 1000-gpm capacity ..... Graver Water Conditioning Co.
Lime feeders and slakers ..... Infilco Inc.
Sphericon units, 26-ft. diameter, 60,000 lbs/hr capacity ..... Graver Water Conditioning Co.

Finishing area

Banding machines ..... Acme Steel Co.
Lowerator, hydraulic ..... Rotary Lift Co.
Platform scale ..... Toledo Scale Co.
Roll-handling system, complete with slate, live roll, roller, flight conveyors, etc. (See ad on page 1021) ..... Jervis B. Webb Co.

General equipment

Air dryer, for pneumatic instrument control systems ..... Anders Lykens Corp.
Blow-off valves (16), unit tandem ..... Yarnall-Waring Co.
Car shaker hoist ..... Yale & Towne Mfg. Co.
Desuperheater pumping units, 6-in. OOBCKL, 13-stage VLT pumps, 25 gpm, 650-ft head ..... Byron-Jackson, Pump Div.

Principal equipment (contd.)

Fire pump, 8-in., 2,500-gpm ..... Peerless Pump Div.
Gauges, Ashcroft, Type 1279 ..... Manning, Maxwell & Moore Inc.
Impulse steam traps and strainers (2) ..... Yarnall-Waring Co.
Lime crusher, 200 ton/day capacity ..... Gruendler Crusher & Pulverizing Co.
Oil purifiers for turbine ..... De Laval Steam Turbine Co.
Pressure-reducing and desuperheating equipment ..... Republic Flow Meters Co.
Pumps, type W and type VM, for sludge-removal .... Dorr-Oliver Inc.
Pumps, Model F, Hastelloy "C" metal driven by ½-hp motor, for delivery of sulfuric acid to pulp storage chests ..... Eastern Industries Inc.
Rex traveling water screens ..... Chain-Belt Co.
Saran-lined pipe ..... Dow Chemical Co.
Starch and borax conveying elevators, Redler, 5-in. and 7-in. L type ..... Stephens-Adamson Mfg. Co.
Steam distribution meters ..... Republic Flow Meters Co.
Valves ..... Manning, Maxwell & Moore Inc.
Water level indicators (5) ..... Yarnall-Waring Co.

Of special interest is the regenerative tension winder drive (believed to be the world's largest), which is installed on the kraft board machine rewinder. A 500-hp direct-coupled braking generator operates over a mill roll build-down range of 4 to 1, while controlling sheet tension to a preset value of 2½-11½ lb. per inch of width. Two 400-hp motors power the windup stand at sheet speeds of up to 6500 fpm. The drive can be accelerated or decelerated in approximately ½ min., while emergency stopping time can be set for about 15 sec.

Finishing area

The finishing area features a unique roll-handling system. Slat conveyors in this system are of special design and made to withstand the weight of a heavy lift truck load rolling over the conveyor.

The live roll conveyors are of standard design with each roll individually driven, while the roller flight conveyors feature special take-up provisions. Turn tables, roll ejectors and roll upenders were specially designed for this particular system.

Briefly, the rolls from the rewinder are pushed onto the escapement table, which releases them in sets to the lowerator (see diagram). The lowerator delivers these sets of rolls to the escapement table on the ground floor, which delivers one roll at a time to No. 1 slat conveyor. From No. 1 slat conveyor the rolls travel over No. 2 roller flight conveyor, where the leading end is automatically banded. The rolls then pass to the live roll conveyor No. 3 and discharge by way of a turntable to roller flight conveyor No. 4.

Roller flight conveyor No. 4 conveys the roll through the next automatic banding station, where the other end is banded and discharged to slat conveyor No. 5, which conveys the roll to scale conveyor No. 6.

After the roll is weighed and marked, it is discharged to slat conveyor No. 7, where it is given an electronic identity and sent to any discharge point on conveyors 8, 9 or 10.

Chemical recovery and liquor-making

The expansion required two additional lines of sextuple-effect evaporators, each line capable of concentrating almost 400,000 lb. per hr. of weak liquor to 50-per cent solids. Each line of evaporators has a boiling point rise recorder to determine final liquor concentration.

Two Model LQ 212 heavy-duty pumps are handling approximately 25,000 gal. per day of soap skimmings recovered during liquor evaporation, while a third pump (a Model M381) pumps these skimmings from the large storage tank into railroad tanker cars.

Cooling water for the evaporator condensers is supplied from the salt water system by two 30-in. (suction) × 24-in. (discharge) horizontally-split case double-suction 20,000-gpm suction pumps driven by 350-hp motors. To resist corrosion the pump casings are made of 2-per cent nickel cast iron; while the impellers, shafts and wearing rings are stainless steel.

The condensers are protected by an interesting installation of five semi-automatic back-flushing strainers. The rotary-spray back-flushing strainer used in this application is a variation of the standard twin strainer type, where the baskets need not be removed for dumping but are cleaned by a water spray coming from a revolving spray pipe equipped with two rows of nozzles.

The recovery system includes two new recovery boilers rated at 1,150,000 lb. of dry solids per day and producing approximately 180,000 lb. of steam per hr. each at 625 psi and 750°F. Each unit is equipped with a panel superheater, decanting furnace bottom, tangential air system and two 13-ft × 14-ft. tubular evaporators.

Instrumentation and automatic control equipment on the recovery units include liquor flow-air flow ratio control and cascade evaporator density control. A new recausticizing system includes four causticizer tanks (15-ft. diameter × 10-ft. deep), one white liquor clarifier tank (45-ft. diameter × 30-ft. deep), one two-stage lime and washer tank (45-ft. diameter × 30-ft. deep), two lime mud storage tanks (20-ft. diameter × 20-ft. deep), one green liquor clarifier tank (40-ft. diameter × 24-ft. deep) and one dregs washer tank (35-ft. diameter × 24-ft. deep).

Two additional 9-ft. diameter × 250-ft. long lime kilns were installed. These were equipped with oil burners, gas scrubbers, fans and controls.

The new lime slaker is a 7 × 50-ft. self-classifying rotary type. It is equipped with an integral type classifier, which will efficiently classify the slaked material. The lime and liquor for slaking are set at one end of the slaker and agitated by the internal agitators. The slaked lime in suspension passes through the slaker and overflows into the circular launder and then through the discharge part of the pump to the remainder of the system. Spirals in the conical end of the slaker reject the grits into the hopper.

The Airveyor salt cake system and the lime systems were simply expanded by the addition of new storage bins and screw conveyors to serve the expanded evaporator and causticizing systems. This was done at the additional cost of equipment of approximately 40 per cent of the original equipment.

Steam and electric power

Five new boilers were installed. This includes two new power boilers rated at 200,000 lb. steam per hr. each, one new bark boiler rated at 135,000 lb. per hr and two new recovery boilers capable of producing approximately 180,000 lb. per hr. each.

The power boilers are of "VU50B" design and are fuel oil-fired with provision for possible future gas-firing. Bark and recovery boilers are equipped with auxiliary oil burners. An additional 30,000-barrel fuel oil storage tank was installed, as well as a fuel oil pump of 100 gpm capacity

(Continued on page 997)

Problems of switchgear application in pulp and paper mills*

C. A. FLETCHINGER
International Paper Co.

A well-designed electrical system should be maintained and kept flexible; problems of crowded electric centers and overloaded equipment should be solved before they become critical.

THE PRIME SOURCE of power to carry the wood through the various stages of the pulp and paper manufacturing process is electrical energy. Since pulp and paper mills operate continuously 24 hours a day, seven days a week, with only several shutdowns a year for national holidays, the electrical system must be dependable and trouble-free in order that the blant will have a minimum of downtime. Once production is lost, it can never be made up by overtime in this industry. Therefore, the need for a well designed electrical system should be a primary consideration.

The electrical characteristics of a typical paper mill are as follows:

1. Short distance from generation to consumption of power. This point eliminates transmission line problems as well as voltage drop troubles. However, it creates others; namely, high fault currents.
2. High fault currents. These are caused by short transmission, as mentioned above, and large consumption of energy at generated voltage and synchronous motors.
3. High power factor. Since most mills require large motors at low speed for refiners and certain types of pumps, it is economical to install synchronous motors, which supply sufficient corrective KVARS to allow the mill to operate with at least 90 per cent pf.
4. Across-the-line starting. All motors large and small are started this way in the newer mills. This is true even in the older mills except for motors that have a high inertia load, such as chipper motors.
5. Distribution system. In most installations each department has its own breaker in the powerhouse or substation and is served by a radial system of feeders with no loop feeds or ties. In most cases, loop feeds cannot be justified either economically or from an operating basis.
6. Types of motors used. The majority of motors used are squirrel cage induction motors. While a smaller number are of the synchronous type, these represent a large portion of the total horsepower. An increasing requirement is for dc drives, where variable speed is required. When dc is needed, a packaged drive is generally installed.

Problems in construction of new mills

The ultimate size and load of the mill must be known before the electrical system can be designed intelligently. However, it is not necessary to have a detailed load survey at this point, because if the proposed tonnage and type of product is known, a realistic horsepower figure by departments can be ascertained from TAPPI constants, from past experience or from similar installations.

Selection of switchgear. The ultimate size of the mill and the type of product to be manufactured will tie down the amount of power that will be required. Experience has proved that the electrical load in a paper mill grows continually. Growth coupled with the rapid expansion has resulted in a trend to higher voltages and load center type distribution. This results in lower short circuit currents, less line losses, lower voltage drops, allows expansion to be carried on without long shutdowns and permits almost unlimited expansion.

Twenty years ago a 9375-KVA turbo generator supplied ample electrical capacity for a kraft paper machine. This could be handled by a 2400-v system with breakers having a rating of 60,000 amperes momentary and 150,000-KVA interrupting duty. These breakers along with synchronizing reactors could accommodate roughly three generators and three machines. The limiting factor of the breaker at this voltage is momentary rating.

Today a mill with a large modern high-speed paper machine requires around 25,000 KVA, and a similar newsprint mill needs about 51,000 KVA. When these two are installed in a single mill, 13.8-KV generation and distribution is mandatory, with breakers having 60,000 amperes momentary rating and an interrupting capacity of 750,000 KVA. However, by utilizing synchronizing reactors, this switchboard could be expanded to include another 51,000-KVA generator and another newsprint machine. At 13.8 KV the interrupting duty rating of the breaker is the limiting factor.

Reactors and a synchronizing bus will eventually have to be installed in any switchboard when it is expanded. Therefore, it is wise to leave room between bus sections for the reactors so they can be installed in metal enclosures in line with the switchboard. This forethought will not only save time tieing in the equipment but will also give a much neater appearance and be much safer from a personnel standpoint.

Fault currents. The constants for the calculations of anticipated fault currents can be obtained from the AIEE Publication No. 952, "Electrical Power Distribution for Industrial Plants". The calculations are made for bolted faults in the bus section of the main switchboard.

Since the feeder runs are short, they offer practically no impedance to the fault currents; therefore, they are neglected in the calculations. Furthermore, for the sake of simplicity the loads of the individual breakers can be grouped into bus sections and then calculated. This not only saves a great deal of time but will give results that are satisfactory for switchgear purchasing.

Fig. 1 is an example of a simple way of tabulating fault currents at any generator, reactor or bus section

*Presented at A. I. E. E. Pulp & Paper Conference.

in the system. Most examples shown in the texts go through a reduction process to end up with a simple circuit, and this reduction process is required for each point where it is desired to calculate fault current.

Low-voltage switchgear. Power centers and low-voltage metal-clad drawout switchgear are standard equipment in new installations today. This combination eliminates the three single-phase transformers, overhead wiring box and molded case group breakers, which require considerably more space, cost more initially to purchase and install.

Furthermore, the three-phase transformer with its connected metal-clad switchgear and incoming line compartment is much safer to operate and maintain and has a much neater appearance. In addition, it is much easier to expand or duplicate an existing installation utilizing metal-clad switchgear.

Once the load by departments is known and the breaking point of high- and low-voltage motors established, the sizes of the power centers can be selected. For the large mills it should be emphasized that for the purpose of flexibility, interchangeability, taking care of future additions and simplicity, one size power center should be selected and standardized where possible. Initially, it may cost more, but eventually it will pay off.

The use of drawout magnetic air circuit breakers with their selective trip setting on overload and instantaneous faults makes this plan very flexible and gives close protection to the transformer and load. Furthermore, these breakers are extremely fast, very rugged, not affected by high ambient temperatures and easy to maintain.

The utilization of outdoor power centers has merit particularly when space for an indoor installation is not attainable or when production equipment has to be shifted to an undesirable location to make room for switchgear.

Another possibility is to locate the transformer outside the building and the low-voltage switchgear inside the building, connecting the two with a short piece of bus duct. However, this method should not be used if the length of duct is long because of cost and voltage drop. This scheme enables the transformer to operate efficiently without the installation of an air-handling system to cool the transformers; permits operation of breakers from the same room where motor controls are located, and allows the use of oil-filled transformers, whereas if the transformers were located indoors either dry type or non-inflammable type would have to be installed, both on which cost more than oil-filled.

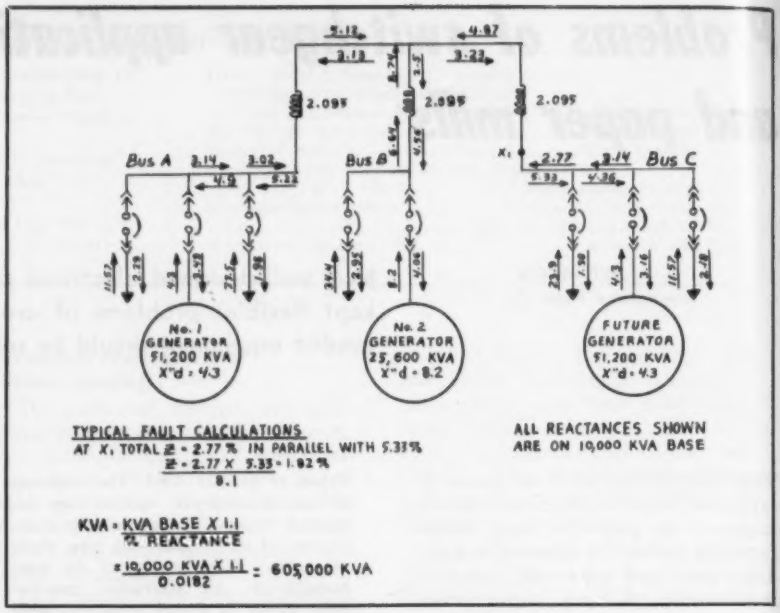

Bus A
Bus B
Bus C
No. 1 GENERATOR 51,200 KVA X"d = 9.3
No. 2 GENERATOR 25,600 KVA X"d = 8.2
FUTURE GENERATOR 51,200 KVA X"d = 9.3
TYPICAL FAULT CALCULATIONS
AT X, TOTAL % = 2.77 % IN PARALLEL WITH 5.33%
% = 2.77 X 5.33 = 1.82 %
8.1
KVA = KVA BASE X 1.1 / % REACTANCE
= 10,000 KVA X 1.1 / 0.0182 = 605,000 KVA
ALL REACTANCES SHOWN ARE ON 10,000 KVA BASE

Fig. 1—Example of a simple way of tabulating fault currents.

Breaking point. There are many variables that affect the breaking point of high- and low-voltage motors; however, the solution ends up being a matter of economics. With larger paper machines at faster speeds the horsepower requirements of the pump drives increase accordingly. Therefore, the need for a larger number of motors in the 75- to 200-hp range has increased considerably.

Major points to be considered are:

1. **Distribution voltage . . . If this is 12-KV or higher, transformers will have to be used for all motors (except possibly grinder motors) regardless of the breaking point; whereas if the distribution voltage were 2300 or 4160 v, transformers for the high-voltage motors would not be necessary.**
2. **Motor cost . . . 440-v motors, 75 - 200 hp, cost approximately 10 per cent less than one at 2300.**
3. **Control cost . . . Low-voltage control for a 60 - 100 hp, 440-v motor costs approximately 30 per cent of what a 2300-v starter costs.**
4. **Wire and conduit . . . For motors in the 75 - 100 hp bracket, wire and conduit for a 2300-v motor is about 30 per cent cheaper than for a 440-v motor; for motors in the 125 - 200 hp bracket, wire and conduit for 2300-v motors is about 50 per cent cheaper than for 440-v motors.**
5. **Space . . . Low-voltage control takes considerably less space. A certain manufacturer's 2300-v starter required a space 38 in. wide and 30 in. deep; whereas in a stack of 440-v control, 24 in. wide and 13½ in. deep, it is possible to install 3 - 100 hp starters or 1 - 200 hp.**
6. **Number and size of motors . . . Once this and their breakdown by departments is known, the most attractive plan can be determined. This plan should be evaluated not only for the present needs, but also for future planned additions. As stated previously, this is not only an electrical consideration but an economic one as well.**

Problems in an existing mill

The following problems are quite typical of a four-machine board mill that is 20 years old. This phantom mill is like so many others in the South that have grown beyond the wildest expectations of their original planners. Furthermore, the electrical load has increased faster than the steam load, making it necessary to add higher pressure, higher temperature boilers and turbines to take more heat out of the steam in the turbine in an effort to balance the steam and electrical load.

Overloaded switchboard. Most mills built between 1935 and 1941 utilized 2400-v generation and distribution. The maximum rating for a 2400-v breaker for industrial use is 60,000 amperes momentary duty and 150,000 KVA interrupting duty.

These breakers were well within their rating until the war, when an additional paper machine and turbo-

generator were installed. That brought the available fault current up to the limit of the breaker rating and in some cases exceeded it. To utilize the existing equipment to the fullest generator or bus section reactors were installed and bus sections isolated.

Installing additional reactors in an existing mill that had made no provision for them originally is a hard job, because space is at a premium, and a total shutdown of several days is required to install and connect them. Furthermore, additional reactors create voltage drop problems, reduce power faction and at best are a good compromise. But, they are necessary to make the original investment workable in a changing era. Most likely in order to get these reactors installed long bus runs had to be made which should be protected by differential relaying.

Crowded electric centers. The easiest way to solve this problem is to annex the required space adjacent to the center. However, in most cases this is impossible because of existing equipment located in this area or by blocking equipment accesses.

Another alternative is to relocate the three or six single-phase transformers outside the center, preferably outdoors if that is possible without making the secondary runs too long. Generally, this will give an additional 30 to 50 per cent more space at a cheap cost. Most oil-filled transformers are designed for outdoor service; however, it is wise to check bushings for outdoor duty before moving transformers outside. The secondary runs to the group breakers, which have remained inside, can be made with single conductor rubber-insulated neoprene-covered wire in conduit or tray. If the conduit, wire and transformer bases are installed prior to a shutdown, it is possible to move a transformer bank and reconnect it within 4 hrs. depending on local conditions.

Since all existing starters are the combination type with breaker and contactor mounted in a NEMA 1 enclosure mounted on a 6-ft. group (or wiring) box, it may be proved in extreme cases that control centers could be worked in, thereby replacing the existing starters. If this can be done it will provide considerable space since this type installation takes less space. However, it is difficult or almost impossible to junk operating equipment of this type unless there is some other good reasons such as obsolescence or deterioration.

Changing breaking point. Some mills constructed during the late 30s used 440-v motors on all drives 50 hp and below and 2300-v motors on all drives 60 hp and up. This was practical electrically and economically 20 years ago, but the increased production through the years has multiplied the number of motors in the 60-100 hp bracket. For example, where a drive for a stock pump took 50 hp 20 years ago, 75 to 100 hp is required now.

The economics of maintaining such a low breaking point is very costly because a 2300-v motor control for a 100-hp motor costs three times as much as a comparable starter for a 440-v motor and requires two to three times as much space. Also, a 2300-v 100-hp motor costs about 10 per cent more than a similar 440-v motor.

Changing the low-voltage hp breaking point must be studied from many angles and definitely on a mill basis not just a departmental one. Some of the considerations are as follows:

1. Cost of additional transformer capacity and group breakers.
2. Cost of rerunning conduit and wire to existing motors.
3. Cost of re-connecting or rewinding the existing 2300-v motors for 440-v service.
4. Cost of additional spare motors that will be required during transitional period.

Once a new breaking point has been decided upon, a long-range program must be undertaken to carry out the scheme. In addition, an economic opportunity must be found — that is, money must be obtained to start the program. Expansion in a single department so that transformers and switchgear can be purchased should be the starting point.

Short Circuit Study Including Present and Future Loads

	Conn. HP	Equiv. KVA	Self $X''d$	Base $X'd$	10,000 KVA $X''d$	10,000 KVA $X'd$	Combined $X''d$	Combined $X'd$
BUS A								
13,800-V Syn.	48,000	37,200	29	43	7.8	11.57	7.8	11.57
2,300-V Syn.	4,000	4,000	21	31	52.5	77.5	....	77.5
2,300-V Ind.	7,800	7,800	26	....	33.4	....	9.7	....
440-V Ind.	17,000	17,000	31	....	18.3	....	....	....
No. 1 Generator	....	51,200	16.5	22	3.22	4.3	3.22	4.3
BUS B								
13,800-V Syn.	....	....	....	....	....	....	....	....
2,300-V Syn.	9,000	9,000	21	31	23.4	34.4	....	34.4
2,300-V Ind.	18,000	18,000	26	....	14.5	....	4.84	....
440-V Ind.	30,000	30,000	31	....	10.35	....	....	....
No. 2 Generator	....	25,600	16	21	6.24	8.2	6.24	8.2
BUS C								
13,800-V Syn.	48,000	37,000	29	43	7.8	11.57	7.8	11.57
2,300-V Syn.	13,000	13,000	21	31	16.2	23.9	....	23.9
2,300-V Ind.	1,000	1,000	26	....	260.0	....	10.54	....
440-V Ind.	9,000	9,000	31	....	34.5	....	....	....
No. 3 Generator	....	51,200	16.5	22	3.22	4.3	3.22	4.3
REACTORS	....	28,650	6	....	2.095	2.095	2.095	2.095

Importance of electrical system

One of the more important problems an electrical engineer has is convincing management that a need exists for a first-class electrical system. This includes top-quality switchgear of proper type, a good distribution system and adequate space for electric centers. Since management is interested in minimum investment and maximum return, it must be proved that a high initial capital investment required for this ideal system will make money for the company over a period of years.

Management has high regard for the vital raw materials used in the process and spends considerable money making sure the plant never depletes its stock of wood and chemicals. Therefore, management should have similar regard for a service that cannot be stored, and the interruption of which immediately stops the process of making paper.

Conclusions

A well-designed electrical system if maintained, kept flexible, will give reliable service and minimum cost over a period of years. This can be done only by a very good preventive maintenance program, having the minor additions or alterations engineered and not just added in a haphazard manner. If it is at all possible, problems involving crowded electric centers, overloaded equipment, should be anticipated and solved before they reach a crisis, which if happens costs many times more to solve than if handled in an orderly fashion.

Cold soda semichemical pulping — a discussion*

Moderator: Harry E. Weston, American Paper & Pulp Mill Superintendents Association

Panel Members: LeRoy J. Bauer, Bauer Bros. Co.; Kenton J. Brown, United States Forest Products Laboratory; W. G. Dedert, Swenson Evaporator Co.; Carl Horst, American Pulp & Paper Co.; W. J. Nolan, Department of Chemical Engineering, University of Florida; C. N. Rogers, Conoco Products Co.; M. R. Shaffer, Department of Chemical Engineering, University of Florida, and Dr. J. N. Swartz, Bowaters Southern Paper Corp.

Yellowing of cold soda pulp

Q. (Dr. H. H. Nadelman, Western Michigan University): I would like to address my question to Mr. Brown. I was very much interested in your examination of the reasons for the yellowing of cold caustic soda pulp. If I remember correctly, you took some aspen sawdust and treated it with a number of extractive solvents: water, benzene, alcohol, ether and others. You then used the extracted wood flour for treatment with caustic soda. In addition, you had some Cross & Bevan cellulose that you treated with caustic soda. You observed the effect of caustic soda and found that extraction with water or organic solvents did not influence the brown color caused by caustic soda, whereas in the treatment of delignified wood flour (Cross & Bevan cellulose) you did not get any discoloration. The question occurred to me: Is that actually a valid test? Shouldn't one take the extracted wood flour, treat it with caustic soda, then bleach it and find out what effect the extraction treatment has on the bleachability and on the final color of the hypochlorite-bleached cold caustic soda pulp?

A. (K. J. Brown, U.S. Forest Products Laboratory): Dr. Nadelman, this particular exploratory experiment was not thorough to the extent of following through and bleaching the pulp that we extracted with solvents. That would have been, as you suggested, a much more complete experiment. I shall take that suggestion to heart and recommend it when I return. But, as I mentioned, this is just a preliminary test. We are just getting started in trying to find out and understand what is causing the yellow color. We thought this gave some indication, as was commonly believed before, that lignin is the cause. I have talked to lignin chemists at our laboratory, and they have been quite definite about it. They said that, from the literature and from this particular small experiment that I explained, they would definitely conclude that lignin is the main cause of the color. However, we shall probably continue further and examine the problem more closely.

(Dr. Nadelman): Thank you very much, Mr. Brown. I would like to explain what led me to make the remark. We all know that chlorinated pulp, if we increase the pH and bring it to the alkaline side, changes to a dark color. Thus, color itself is not necessarily an indication of what will happen later on in final bleaching. Furthermore, one should investigate if lignin in its original form is the source of yellow or brown color or if we have a situation mentioned in the literature, where even hypochlorite in alkaline condition makes possible the formation of chlorinated lignins. We should look into the matter very carefully. Possibly hypochlorite treatment causes oxidation and chlorination simultaneously. The presence of lignin increases reflectance in the yellow range.

(Mr. Brown): Dr. Nadelman, your remarks on bleaching are quite significant, I think. We found that multi-stage bleaching might be an effective way to remove the yellow color from cold soda pulp. Commenting on your remarks that this yellow color in single-stage bleaching might be an indicator effect, that is true; it is partly an indicator effect controlled by pH.

Multi-stage bleaching is more than just oxidation and has been shown to remove the yellow color. I believe Roy Bauer can comment on that.

(LeRoy J. Bauer Bros. Co.): I have some samples here that we might pass down to the audience. They are actually some samples prepared by the du Pont Company. The first sample is the unbleached cold soda pulp. The second is after hypo treatment, the third is the peroxide stage. You will notice the very yellow cast of these two samples. The last sample was given a final treatment with hydrosulfite and is definitely white. These samples are about three or four months old.

Q. (Dr. W. J. Nolan, University of Florida): What is that last sample?

A. (Mr. Bauer): That is the final stage of the bleaching operation. It follows the peroxide treatment and consists of a sodium hydrosulfite bleach carried out for 1 hr. at 150°F at about 5 per cent consistency.

Chemical recovery in cold soda pulping

Q. (H. A. Jacoby, Chicago Bridge & Iron Co.): Would you care to make any comments on the possibilities of chemical recovery in the cold soda process?

A. (Mr. Brown): We thought at the start, about three or four years ago, that the pollution problem might not be severe but worth investigating to see if a recovery system might be needed in the cold soda process. We ran extensive tests, recycling liquors in laboratory equipment, to see how the solubilized organic matter built up in the liquor drained from the chips, in the fiberizing liquor, in the wash waters, and so forth. The problem is there. The purpose for those experiments, first of all, was to find out just how serious the problem was. Secondly, it was to acquire a background for further study towards either the recovery of chemical (perhaps dialysis or electrolysis) or evaporation-burning, and so forth. We have a report published on the results. I believe it is called, "Recycling, or Reusing Caustic Soda Liquors in the Cold Soda Process". Both the closed and partially-closed systems are included. The results there showed that the total solids in the liquor under ordinary circumstances, making pulp for a book type of paper, would build up to about 15 per cent after 15 to 20 recyclings. This build-up darkened the pulp about 4 or 5 percentage points but did not change the strength properties at all. There was nothing to worry about as far as quality was concerned, just the color was darker. We made an attempt through some of the chemical companies to have dialysis experiments run. The results of those tests showed that the membranes would clog up quite quickly with the organic matter. There was a mechanical problem, but the sodium was recovered. That is about the only attempt we made towards a recovery process. With a commercial application, we might refer particularly to the Gould mill. There, the problem did not appear to be too severe. Right now

*Arranged from a transcript of the discussion of semichemical pulping held December 3, 1957, as part of the Sixth Annual Pulp & Paper Conference at the University of Florida in Gainesville.

I think we are in a position where we are not too worried. If the pulp is made at a high yield, a groundwood substitute type, small amounts of chemical are involved. For lower yields, corrugating board production, where more chemical is used, then there might be a problem. Someone else might want to comment on that. You might want to say something about what the Gould experience has been, Roy.

(Mr. Bauer): At the present time recovery is under study. However, there is no attempt made to recover nor to recycle the waste liquor. Actually, at the present time, it is discharged from the press to the sewer.

(Mr. Brown): Yes, that is the case with the press liquor, Roy. However, at Gould didn't you reuse all of the liquor drained from the chips in the rapid-cycle digester? As I understand from Ken Snyder, they have used that ever since they started the operation.

(Mr. Bauer): That is right. After the chips are impregnated, the liquor is taken from the digester back to the supply tank. And then the digester is blown so that liquor is reused over and over again. It has worked out very well without a problem.

(Mr. Brown): I think that is interesting because in our laboratory experiments we have found that the total solids will build up after 15 or 20 experiments. Here they are using it hundreds and hundreds of times and still getting by with it.

(Mr. Bauer): Of course, the material from the press is being lost. We have not really checked through to find out what effect the amount of liquid carried off with the chips is having on the overall picture.

Q. (Mr. Jacoby): There is just one more question about high yields. The discussion would indicate that such losses as do occur wind up somewhere down at the paper machine end of the process and the makeup, then, is just makeup caustic reintroduced along with the recycled liquor. Is that a correct statement?

A. (Mr. Bauer): Yes, I would say so. However, there is a washing process before the pulp is sent to the machine, where waste material is discharged from the process.

Q. (P. B. Borlew, Owens-Illinois Glass Co.): Maybe I didn't listen attentively to Mr. Bauer's presentation. Are you making corrugating medium at Gould?

A. (Mr. Bauer): No, they are printing grade papers at Gould.

Q. (Mr. Borlew): Could you make corrugating medium?

A. (Mr. Bauer): I don't see why not.

Q. (Mr. Borlew): Have you tried?

A. (Mr. Bauer): Well, I don't know of an actual application on corrugated medium.

(Dr. D. F. Starr, V. D. Anderson Co.): There is actually a cold soda process for manufacturing corrugating medium at Coshocton, Ohio. They use a cold soda process and a screw press to recover the black liquor.

Q. (Dr. Nolan): Do they recover their black liquor?

A. (Dr. Starr): No, they do not have a recovery system. However, they do press out the black liquor and recycle it. I would think it is very much the same as the Gould process.

Q. (John Hoad, Hoad & Associates): In regards to recovery, I think it is true of a relatively small mill that you do not have much of a problem. But, if we get up to 300- or 400-ton mills at the end yields of 85 to 90 per cent, we not only have a lot of organic solids that have to be disposed of, but also a considerable amount of spent caustic liquor. Does anyone here know of any work that is going on in recovery? I think that is not considered a problem now principally because of the size of the mills being operated. It is going to be a problem as soon as you get a bigger mill.

A. (Dr. J. N. Swartz, Bowaters-Southern Paper Co.): Well, I think that we can tell you something about the recovery problem. As has been previously stated, assuming we take up in high-yield cold soda, 4 per cent of caustic—or, even higher than that, in the range of 5 to 10 per cent caustic, theoretically we can recover 2/3 of that in the press. The amount that remains of dissolved organics and chemicals in the fiber is quite significant and might amount in some cases to 2/3 of the original chemical and B.O.D. That should be given a further washing in either a secondary press or a vacuum type washer. From that, we come to the necessity for chemical recovery. But, this is straight caustic, and you can recirculate, as Mr. Brown mentioned, and get up to 15 per cent solids. The total amount of solids per ton is quite low, and it should not present the difficulties encountered with neutral sulfite systems. In cross recovery with the kraft process, there should not be any precipitation, it should actually raise the pH of the kraft liquors, and the liquor should burn quite satisfactorily. Cross recovery with a kraft mill seems quite reasonable. Alternatively, for a mill of 400 tons capacity a very small recovery system should handle it as a straight soda process.

Pretreatment of chips

(G. H. Saunders, Kimberly-Clark Corp.): I should like to ask Ken Brown a question concerning the work that he did on the vacuum pretreatment of chips, getting the caustic into the chips. In the temperature, concentration and time studies, did he do any power checks? Not just the quality of the pulp, but did you get the hp days per air-dry ton during that series of experiments that you reported?

(Mr. Brown): Yes, that has been done. It was published in another report. I have the reference here, "The Effect of Pre-evacuation On the Pulping Characteristics of Aspen". There were two references to it. There was one that was published by the APPA Committee on Coordination of Research in 1953, the title of the paper was, "Aspects of Cold Soda Pulping in Relation to Penetration". That is not published in the APPA yearly report. It discusses, mainly, the mechanism of penetration but this report on pulping aspen has also a section showing that pre-evacuating chips improves the penetration. Of course, in that case it lowers the power requirement. However, there have been some other experiments that showed no effect. So, I would not want to go out on a limb and draw any conclusion or make any definite statement on it.

Q. (Mr. Saunders): I believe some of your work was on oak, so apparently there were no power checks on the oak?

A. (Mr. Brown): I cannot recall any. Those were small-scale experiments we were talking about yesterday. Those blocks were treated in a basket hung in an autoclave of 0.80-cu. ft. capacity. Liquor surrounded them. After impregnation they were taken out. There were also chips around the baskets containing the blocks. Usually about five blocks were put into the wire basket and were surrounded by 6 or 8 lb. of chips. After treatment, the basket was pulled out, measurements were made on the blocks, and the chips were run through a small 8-in. single-disk mill. We usually read the power, but of course it does not mean much in comparison with a commercial mill.

Q. (Mr. Saunders) In other words you did not make enough to run through your 36-in. mill.

A. (Mr. Brown): No, we only like to report those figures obtained through the 36-in. double disk. I do not recall any oak pre-evacuation experiments on a large scale.

Q. (Mr. Saunders): Is there anybody else on the panel who would like to comment on that type of thing? Dr. Swartz?

A. (Dr. Swartz): Some of the results we have are so opposite to what was told yesterday that we could not see any advantage in pre-evacuation.

(Mr. Saunders): I think you should definitely get more caustic into the chip. My question is on power. I think any quality change would be so small that you could hardly see it. The only place I can see where there might be any great difference would be in the power part of the process.

(Mr. Brown): If you want to correlate extent of treatment, or thoroughness of the treatment with power, you might conclude that the continuous process, where liquor is distributed to all the fibers, is about as uniform as you will ever get it. In this method you get a chip breakdown along with the liquor treatment. There the total power will still add up to about the same as when the chips are soaked for a couple of hours at atmospheric pressure and you can see the dry centers.

Q. (Mr. Saunders): Are you referring to the Koller mills?

A. (Mr. Brown): Yes, the total amount of energy put into the Koller mill, press if you have it and the disk

mill all add up to about what you might use by milling chips that had been steeped for a couple of hours and then opened up.

Q. (Mr. Saunders): That works right into my next question. I believe Mr. Brown showed some slides on chips that were broken up like match sticks, similar, I think, to what Dr. Nolan does with his chip breaker and what Charlie Rogers is probably getting into with his chip pretreatment. Did you correlate that type of breakdown vs. your Koller mill? I believe your results showed that you get a little lower strength with the Koller mill.

A. (Mr. Brown): Let me comment, first, on the breakdown. I chose the particular size to report on because that was the largest fraction that we could get by on and still get complete penetration. With anything larger than that, with atmospheric soaking or natural penetration methods, there was always a dry center. In other words, if you have a match stick chip 1/8 of an inch square you will still have a slightly dry center. This smaller material did not have dry centers. So we assumed that was the ultimate, or the point where time was the only variable. In other words, diffusion or penetration was not too much of a problem. But so far as correlating that to a Koller mill breakdown, quality-wise, I do not know. I am sure that Koller mill pulping is superior in quality.

Q. (Mr. Saunders): Are there any other methods of pretreatment? I'd like to ask that of the panel in regard to chip breakdown or chip preparation in cold caustic or high-yield neutral sulfite.

A. (Mr. Bauer): We are working on two methods. One uses a press to impregnate and the other uses a single-disk refiner to impregnate. That is what we classify as mechanical impregnation—just to keep the name away from digester and that sort of thing.

Q. (Mr. Saunders): I think the Italians are making cold caustic pulp for tissue. They use a series of rollers, which is similar to the Koller mill, but I do not believe they do quite as much damage. Has anybody tried that?

A. (Mr. Bauer): We have not tried it. I have discussed that with people as well as with our international representatives. As I understand it, the method is not as successful as the Koller mill process because you have to level the chips out. I understand there are two Italian processes. One of them uses a roll that has teeth on it very much like a gear, rather flat. Their difficulty is in attempting to treat each chip uniformly as it goes through. That is the only one that I have had any report on. Actually, no one seems to have any results as to quality. I understand they are making tissue from it.

(Mr. Brown): If you want to continue talking about various aspects of breakdown and treatment there is the Veda Myers roll system. They use 42-in. diameter rolls 32 in. long, with about 1/8-in. separation, turning slowly. It is a high-pressure breakdown in just three stages with 20 min. caustic steep in between each stage. They believe that they give time enough for liquor to become absorbed, with the products of the reaction squeezed out in the next stage. That sounds pretty logical. Our Koller mill approach is to do this rapidly with many, about 100, low-pressure squeezings. You might speak of it as an impact breaking down the chips, knocking off the treated fibers as quickly as they're treated with caustic, exposing new untreated surface. As I mentioned before, this only takes about 30 sec. for 100 compressions. We usually say about 95 per cent quality compared to a vessel treatment of 30 min. to 2 hrs. We have also impregnated liquor into the chips, going through a screw press, breaking it down that way, and quality is very good. There are about as many ways to make this as you can dream up, and they all come very close to soaking chips in open vessels. It is a matter of paying your money and taking your choice right now.

(Dr. Starr): This is in connection with the questions about preimpregnation in the cold soda process and in connection with strengths of cold soda pulps. Some experiments have been done in the pilot plant, using two presses in series and using the sodium hydroxide solution counter currently. The first press carries out coarse fiberizing after about 6 min. of soak. Then these coarse fibers are again treated with sodium hydroxide and pass through the second press, where they are fiberized more finely. The strength of such a pulp, in working with one company on this, compared favorably when fiberizing oak and eucalyptus treated with sodium hydroxide solution. These strengths, CMT, burst, and tear, compared favorably with their semichemical kraft pulp made from soft woods. This two-stage pressing operation makes it essentially a continuous operation with about 6-min. soak before each press. The total time is about 15 or 20 min. from chip to pulp ready to enter the refiner.

Q. (H. R. Adams, St. Joe Paper Co.): I want to ask Mr. Brown or some member of the panel about cold soda. The quality, apparently, on cold soda pulp for corrugating medium on the same order that is comparable to neutral sulfite is a little lower on concora tester. So far, that is evident. I would like to ask whether there is a possibility that, with further improvement, we shall be able to get the cold soda up close to the neutral sulfite?

A. (Mr. Brown): Well, there is always that possibility. No matter how you make it, it is still going to be cold soda pulp. I should like to go back through and qualify your conclusions on strength of cold soda vs. semichemical. I think we have to talk species there. I think it is only fair to compare laboratory tests of both processes and not to compare commercial pulps with laboratory pulps. We have shown that cold soda from aspen will make a board as high in concora test as NSSC from aspen. NSSC will be 10 per cent lower yield. We even excelled, making superior boards from the cold soda in comparison to the semichemical. But, as the density of the wood goes up, say toward the oaks, then the quality of the cold soda is below that of the NSSC. That is typical. What they are doing in the industry when they use the oaks—and there are some mills making 9 point from dense hardwood by the cold soda method—amounts to refining to a lower freeness and running their machines slower. Instead of running at, say, 700 fpm they might run at 500 or something like that, lowering freeness and getting the concora that way. I do not think we can, at the present time, form the sheet at the same freeness and get the strength from the high-density hardwood in cold soda that we can from NSSC.

Economic Impact

(Continued from page 982)

conversion of the wood raw material.

In this case the new Bauer bale method* could be used for drying and baling the semi-converted pulp to the pulp mill located centrally at the railhead or tidewater. This is the so-called bush pulp mill concept. Complete automation is entirely practical, and it is possible for a minimum crew to operate the entire system from a panel board and convert chips into a clean screened unbleached end product in high tonnage quantities.

Pulp bleaching

Bleaching techniques appear to be dedicated to the purification or "refining" of cellulose. In a recent survey of over 850 bleaching patents it was found that over 90 per cent started out as a new method for the purification or "refining" of cellulose, and practically none of the patents was on whitening of cellulosic or cellulose-lignin fibrous materials for use on the paper machine.

Some of the industries literature defines lignin as a white fibrous material associated with cellulose in plant cellular structure. In other words, lignin—the stuff we go to great lengths to remove in pulping and bleaching processes—has possibly the same character of being white and fibrous as the material we want in the end product roll of paper.

It is commercially proved that some cold caustic pulps can be bleached to the 75-to-80 G.E. brightness range in a simple two-stage

*See the August 1956 issue of THE PAPER INDUSTRY.

system at an 80-plus yield level based on wood at a total cost per ton of $50 to $60. In this situation it is obvious that we must be dealing with this white fibrous material lignin, since the relatively mild chemical treatment did little in the way of lignin removal and/or cellulose purification.

The economics of production of this type pulp are excellent if it meets with end product quality requirements. A company's grade structure might be analyzed to see how pulps of this type could be fitted in as a major or supplemental portion of paper machine furnishes.

Conventional bleaching systems are low-density and relatively low-temperature methods. There are some indications that new bleaching agents, higher densities and temperatures of reaction offer possibilities of lower capital cost, better end product quality, higher yields and process simplification.

Papermaking

Paper machine operations are out of the range of the writer's background. The modern trend, however, appears to be toward bigger, faster and wider machines running 24 hours per day. The above is the modern concept of paper machine operations for the reduction of machine converting costs.

Traditionally, the paper process is tied to water. Freshly cut wood contains 50 per cent moisture, and throughout the conversion of wood to paper tremendous volumes of water are handled, mostly at very high water-to-wood ratios. Water is used for pulp washing. Following washing we must evaporate the dilute chemical solutions for burning. Bleaching, screening and cleaning are at low consistency and must be followed by thickening to reduce physical volume. On the paper machine itself we take a very dilute mixture of fiber and water and produce paper by means of draining, vacuum and evaporation. This traditional handling is very expensive, creates extreme pollution problems and other maintenance, labor and cost situations. Should not other means of handling be investigated for possibilities of handling wood chips, pulp and paper at higher densitives and less physical volume?

There are some ideas of forming the paper web with dry fiber utilizing resin bonding or electrostatic deposition of fiber. This and other ideas may have an impact on the future.

Another interesting development is the Beloit-Crown Zellerbach "Little Machine", or the paper machine in the "Bush". This is a small efficient semi-portable paper machine that can be readily located at the market rather than the raw material source. It is interesting to speculate on the possibilities of tying such a machine into the bush pulp mill concept.

Here again the economic factor of freight cost enters the picture. With the current inflationary trends, indications are that freight rates can only go up. If this is the case, the very large mill remotely located from the potential market has a definite present handicap that will become more severe in the future.

St. Regis Mill

(Continued from page 990)

and three fuel oil heaters designed to raise the oil temperature from 90° F to 225° F. The heaters are so arranged that any two of the three may be used for full-capacity output. One of the fuel oil pumps is driven by an "AYRO" turbine and the other by an electric motor.

The power boilers are fully equipped with combustion control and oxygen and combustibles analyzers to guide the proportioning of fuel and air for optimum combustion efficiency.

A new 30,000-kw hydrogen-cooled turbo-generator is equipped with automatic controlled extraction at 160 psi and 65 psi and exhausts into a two-pass surface condenser of 19,000-sq. ft. condensing area. The condenser is of the rectangular type construction making it adaptable for the low headroom of modern industrial buildings. Another feature of the condenser is the tube bundle arrangement, which provides for a complete steam zone around the tube nest with an air offtake at the center of the nest. This has the effect of counterflow of the condensate and steam in the lower half of the condenser. The condenser is equipped with condensate pumps and air ejector equipment.

As in the case of the condenser serving the black liquor evaporating system, brackish seawater is used as the coolant in the surface condenser. This water is strained in three 24-in. back-flushing twin strainers of similar construction as those used in the evaporator system.

Sea water is also strained for use in the condensers in Rex traveling water screens equipped with copper screen cloth in the 3½-ft. basket. Two and one-half-in. pipes equipped with eight spray nozzles discharging about 219 gpm of water per screen are used for debris removal.

Water supply

Five new deep wells were drilled to supply the additional process and boiler makeup water. The wells are 1300-1400 ft. deep and are capable of producing 5000-8000 gpm of water each under artesian pressure. To insure complete reliability, vertical turbine-type deep-well pumps driven by 250-hp motors were installed, one in each well. Centralized control of all pumps is provided from the turbine room.

Three new accelerator units were installed for selective removal of calcium carbonate in the process water. The removal of calcium carbonate is achieved by the use of hydrated lime and alum. The treatment produces a sludge suitable for reburning to provide quick-lime for other plant requirements. An effective recirculation of slurry in these units affords rapid and complete mixing of treating chemicals with the water slurry mixture and minimizes the precipitation of unwanted magnesium hydroxide and consequent silica absorption that usually result from localized overtreatment.

Each unit is rated at 8750 gpm of water, giving a new total capacity for the plant of nearly 50,000,000 gal. per day.

All underwater metal surfaces of accelerators and reservoir are protected by cathodic protection systems.

Other equipment in connection with the process water treatment plant includes three gravimetric lime feeders and lime slakers, metering pumps for liquid alum, flow meters and proportioning equipment for control of chemical feed in proportion to the plant flow rate and automatic control equipment to regulate the flow to the treating units as required by the water level in the plant clear well.

For treatment of boiler makeup water a hot process lime and ion exchange system was supplied. This plant has a rated capacity of 1000 gpm and its basic equipment includes a 26-ft. diameter Sphericone unit, a 132-in. diameter chemical tank to feed dolomitic lime, four 132-ft. diameter pressure filters and three 114-in. diameter high capacity resin zeolite softeners. The latter are designed for semi-automatic operation.

The basic operation of this system is as follows: The dolomitic lime is fed through the hot process unit to reduce the hardness, lower the alkalinity and total solids and reduce the silica in the water. After filtration the water is then passed through hot zeolite softeners, where the remaining hardness is removed down to practically zero value.

HUYCK GENERAL STAFF directs company policy and over-all planning of felt research and development, designing, engineering, manufacturing and sales.

CONSTANTLY IMPROVING FELTS, Huyck's research project leaders, directing over 40 experienced scientists, engineers and technicians, meet regularly to discuss basic and application research.

MEN-FROM-HUYCK, including district managers, sales and field service engineers, get together at Huyck's plant at Aliceville, Alabama — the world's largest modern felt mill — to discuss ways of improving service to papermakers.

HUYCK TEAM MEETINGS BENEFIT PAPERMAKERS

Teamwork is one of the reasons Huyck Felt Co. keeps ahead of the paper industry's changing and increasing felt requirements.

It maintains Huyck's leadership in research, development, designing, engineering and manufacturing — and, above all, assures papermakers of felts that produce better paper, and more of it, at lower felt cost per ton.

Everyday, Huyck holds team meetings. Those scheduled for today could be spent discussing the felt application problems you will be facing tomorrow.

DAILY MEETINGS of design engineering group draw on vast background of technical knowledge and experience in analyzing specific felt requirements.

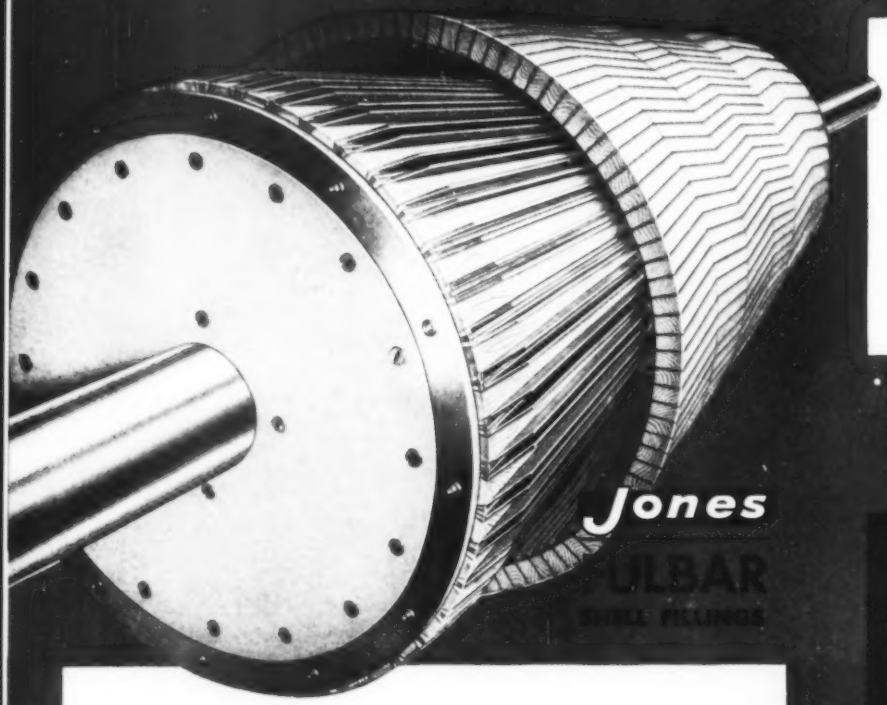
IMPROVING FELT MANUFACTURE, Huyck's machinery and equipment team meets regularly to discuss the latest advances in feltmaking equipment and plans for expansion to meet the ever-increasing demand for new Huyck felts.

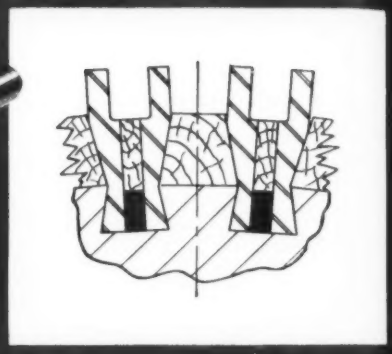
FELT DEVELOPMENT TEAM captains discuss new ideas in weaving, blending of synthetics, chemical treatments — such as the famous 4-D — and new practical felt testing devices.

MANUFACTURING TEAM directs quality control, production planning, scheduling of felt shipments, manufacturing and accounting, assuring Huyck dependability felt after felt.

Ideal Combination for ANY CONICAL REFINER

Jones Adapta-Plug





• Sectional construction simplifies replacement of the bars for all bars. Fillings can be changed to meet any condition without changing plug.

• Note how one-piece construction of FULBAR Filling makes for ease of handling — cuts installation time, often by hours.

• And rigid, one-piece FULBAR readily compensates for inequalities in shell body of old or worn Jordans that would make precise fitting of sectional fillings a real problem.

Completely bandless, the Jones Adapta-Plug is the strongest, most adaptable, most economical plug ever made. Exclusive with Jones, this revolutionary advance in plug design holds bars more securely in place, reduces slot wear and corrosion, offers maximum adaptability and is amazingly easy to strip and fill. Available in solid plug — or Meehanite sleeve form for easy changeover on old plugs.

The rigidity and accuracy of Fulbar one-piece shell fillings eliminate keys and wedges, fit shell body of any Jordan, are far simpler to install, easy to grind in — and the patented Nowave pattern offers no sharp ends on bars to form strings or lumps. Over 700 now in use.

Write today for details and names of satisfied users.

E. D. JONES & SONS COMPANY
Pittsfield, Massachusetts
Builders of Quality Stock Preparation Machinery

IN CANADA: The Alexander Fleck, Ltd., Ottawa

Export Agents: **CASTLE & OVERTON, INC., New York 20, N. Y.**
Foreign Licensees: **FRANCE Batignolles-Chatillon • SPAIN Gabilondo • ITALY de Bartolomeis • JAPAN Mitsubishi •**

43rd annual TAPPI meeting

EMPHASIS ON QUALITY improvement—as applied to technical personnel, raw materials and products—was the note that dominated most of the discussions at the 43rd annual meeting of TAPPI.

The situation with regard to technical personnel training in our high schools and colleges was brought out with characteristic enthusiasm and clarity in a paper by Dr. H. S. Lewis of the Institute of Paper Chemistry. This was followed by a second paper presented by T. P. Collins Jr., technical director of the Hudson Pulp and Paper Corp., who reported on his company's experience with a scholarship program in particular and on similar programs throughout the industry. Among the points emphasized by Dr. Lewis was the fact that the scientific program in this country's high schools is not as hopeless as pictured recently in many speeches and printed articles. The low percentage figures showing the number of students taking physics and chemistry in high schools, he said, is based on a wrong premise. In most high schools these subjects are taught only during a single year, and it is therefore wrong to base these percentage figures, as was done, on the total student enrollment in any one school.

Pulpwood improvement through the application of forest genetics and forest management was discussed at the forest biology sessions, and paper product improvement pervaded the discussions at the general sessions as well as in succeeding technical meetings.

The reelection of Ward D. Harrison of Riegel Paper Corp. as president and of James R. Lientz of Union Bag-Camp Mfg. Co. as vice president was announced at the annual business meeting on February 17.

Elected members to the executive committee were reported as follows:

Philip S. Cade Jr., vice president in charge of manufacturing, Harding-Jones Paper Co., Middletown, Ohio; Foster P. Doane Jr., vice president in charge of manufacturing, Bergstrom Paper Co., Neenah, Wis.; John H. Heuer, vice president and manager of manufacturing, Great Northern Paper Co., Millinocket, Maine; Joseph J. Koenig, laboratory manager, Research and Development Division, Gaylord Container Corp., Division of Crown Zellerbach Corp., St. Louis, Mo.

Tappi medalist

The winner of the 26th Tappi medal was Walter H. Swanson, vice president of research and development, Kimberly-Clark Corp. The medal is awarded annually to an outstanding contributor to the technical advancement of the pulp and paper industry. Swanson is credited for the development of the sulfite digester circulating system. He is also co-author of a book, "The Chemistry of the Sulfite Process", and has written numerous technical papers relating to the paper industry.

Technical sessions

The 125 papers presented at the technical sessions discussed problems in forest biology, paper coatings, wet strength and inter-fiber bonding, cylinder board making, water, dissolving pulp, statistics, fundamental research, structural fibrous materials, microbiology, corrugated containers, graphic arts, wax, sizing, semichemical pulping, alkaline pulping, acid pulping, engineering and pulp purification.

Among the technical papers presented at the general session was that describing the Hurletron moisture control by W. O. Smiley of Electric Eye Equipment Co. This control detects the percentage of water in the paper or paperboard and automatically adjusts the temperature of control dryers to hold the moisture variations to ± 0.25 per cent by weight.

John A. Waugh and Leslie L. Warner, Corning Fiberglass Corp., described the effects of the addition up to 50 per cent glass fiber to sulfite and sulfate and groundwood pulps. The results showed that such additions reduced dimensional movement as much as 40 per cent in some pulps. The paper produced was more stable, showed improved tear resistance, increased porosity, and decreased density.

R. Rosenbaum and E. A. Sloss, Allied Chemical & Dye Corp., discussed low-molecular weight polyethylene-wax coatings for corrugated board. The polyethylenes used were of 1500-2000 molecular weight and used in 20-50 per cent combinations with paraffin wax. The chief application for corrugated cartons coated with these blends has been for packaging appliances and furniture. The scuff resistance and lack of fiber scratching have permitted the elimination of cellulose wadding cushioning. The carton's grease resistance also permits packaging of various bakery products.

The satisfactory use of epoxy linings for concrete stock storage chests and steel tanks was discussed by H. Ray Reynolds, Earl Paint Corp. Stock storage chests can be lined with epoxy resins for approximately half the cost of a tile lining.

Forest biology

Harold L. Mitchell of the U.S. Forest Products Laboratory discussed techniques and equipment used in field sampling and reviewed methods and equipment used in the laboratory to determine: specific gravity, fibril angle, fiber length and proportion of summerwood to springwood. This method of wood quality evaluation is done with increment core samples.

Bruce J. Zobel and Robert L. McElwee, North Carolina State College, discussed the natural variation of the wood specific gravity of *loblolly* pine and reported a broad geographic trend toward lower average specific gravity for stands located further west. They found little relationship between growth rate and specific gravity for wood of the same age. This means that the selection of fast-growing trees does not automatically result in the selection of wood of lower specific gravity.

In another paper on variation of cellulose in loblolly pine Zobel reported that while cellulose yields were consistently higher in mature wood than in juvenile wood of the same tree, there was a definite relationship between the cellulose content of mature woods and that of juvenile wood. For instance, a tree that has low yields in its juvenile wood also has low yields in its mature wood, and high

Ward D. Harrison, reelected Tappi president.

Walter H. Swanson of Kimberly-Clark Corp. receives 26th Tappi Medal.

R. J. Hackett of St. Croix Paper Co.; T. E. Kloss, Allied Chemical & Dye Corp., and F. H. Guernsey of Petrochemicals Corp.

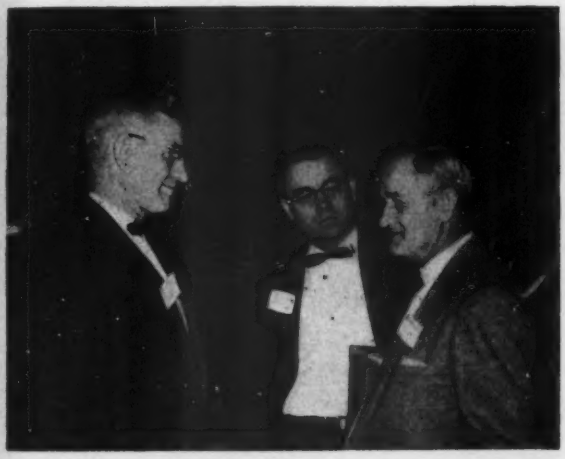
F. Casciani of P. H. Glatfelter Co. and William Landes of Pulp & Paper Testing Laboratory.

Bob Easterly and Everett Mahannah of Ebasco Services Inc. and Ken Running of Halifax Paper Co. Inc.

Bob Skalac of Continental Can Co. Inc. and Paul Hood of International Paper Co.

J. D. Davis of Mead Corp.; Fred Denham of R. T. Vanderbilt Co. Inc., and Ralph Thompson of Hagan Chemicals & Controls Inc.

Fred Kamila and B. F. Perkins II, who is vice president and treasurer of B. F. Perkins & Son Inc.



N. P. Wardwell of Carthage Machine Co., J. K. Powell of Bowaters Southern Paper Corp., and Ray Marsh Sr. of Walter Kidde & Co. Inc.

John Redgrave of Beloit Iron Works, Jim McAlear of the Mason-Neilan Div. of Worthington Corp., and Dr. R. G. Macdonald, secretary-treasurer of Tappi

yields in juvenile wood means high yields in the mature wood.

Series of new latices

L. P. Finnegan of International Latex Corp. described a series of specifically-developed latices for paper application that show an exceptionally strong affinity for cellulose. Papers saturated with these latices show an extremely high internal bond, improved wet strength, high elongation, good tensile strength and resistance to oils, grease and solvents. Internal-bond values obtained were as high as 75 oz. per in. These values are approximately 50 per cent greater than those obtained from papers saturated with conventional latices, it was reported.

Water

David W. Miller of Geraghty, Miller & Hickok outlined a program for the management of the ground-water reservoir in operating well fields. The preservation of original well records, periodic testing for well efficiency and water quality, observations of water level changes in the ground-water reservoir and the compilation of adequate data on pumpage were emphasized.

In the selection of test well sites, the seismic-refraction method can be used to advantage, it was reported by William E. Bonini, Princeton University. The method makes possible the prediction of such critical subsurface data as depth of water table and true bedrock.

The self-purification of a stream can be increased by artificial aeration, it was reported by Martin Baum and J. R. Salvesen, American Can Co. The method consists in the introduction of air into the hydroturbines. Results showed that up to 10,000 lb. of oxygen can be dissolved by turbine aeration per day per 1000 cfs flow.

Corrugated containers

O. M. Cline of Mead Containers Inc. advocated a more effective cor-

rugator scheduling to combat the increased cost of labor and materials. This can be accomplished through (1) full corrugator width scheduling to obtain a maximum yield of square feet per man-hour of cost; (2) the accumulation of orders of a given flute and a given test to permit the use of greater roll width and longer runs without loss of time for changes and clean-ups and (3) a pre-determined set time of running grades and flutes within a week to allow for better production control, more effective machine operation, time-saving by supervision and labor-anticipation of the schedule.

The Pul-Pac system for materials-handling at American Box Board Co. was described by G. R. Wilmer. This system is used in the plant, which covers 225,000 sq. ft. and houses both corrugating container fabrication and solid fiber converting. The unit in this system is basically a fork lift truck with a special gripping attachment mounted ahead of the truck mast, which permits it to pull a load of materials onto special wide forks and ultimately push the load off at a desired place.

Justin D. Hill of Lawrence Paperbox Co. discussed the advantages of using rubber scores. According to Hill, the rubber scores have worked better than metal scores both in savings per order and in the quality of the boxes tested.

The benefits derived from using filming amines in the boiler room of corrugated box plants was discussed by R. T. Cassady of Mead Containers Inc. The main advantage consists in a large increase in the rate of heat transfer obtained through the heat exchange equipment and the removal of corrosion products from the system, which also increases the transfer of heat. Cassady warned that the initial dosage be reduced to 0.5 ppm in order to prevent clogging of valves due to the excessive removal of corrosion products. The dosage may gradually be increased to the required 1.5 ppm in the course of 2-3 months.

Waxes

H. G. Arabian, Shell Oil Co., discussed the blocking temperature of paraffin waxes as a function of wax composition. One of the most effective ways to produce higher blocking waxes without increasing the melting point, he said, is to narrow the molecular weight range of the wax. This, however, is not always desirable because waxes that are narrow in molecular weight range have other undesirable properties such as low tensile strength and poor scuff resistance.

R. C. Fox of California Research Corp. discussed the relationship of wax crystal structure to the water vapor transmission rate. Since water vapor transmission rate depends on the number, size and nature of the paths around the crystallites, any condition that will produce larger and closer packed plate crystals oriented parallel to the plane of the basic sheet will tend to reduce WVTR. Shock cooling of molten wax film in cold water will lead to small unoriented wax crystals with numerous small fissures or microscopic defects, with the result that WVTR will be relatively high. During storage the small fissures are healed, and recrystallization takes place to effectively reduce WVTR. Recrystallization is accelerated by an increase in storage temperature.

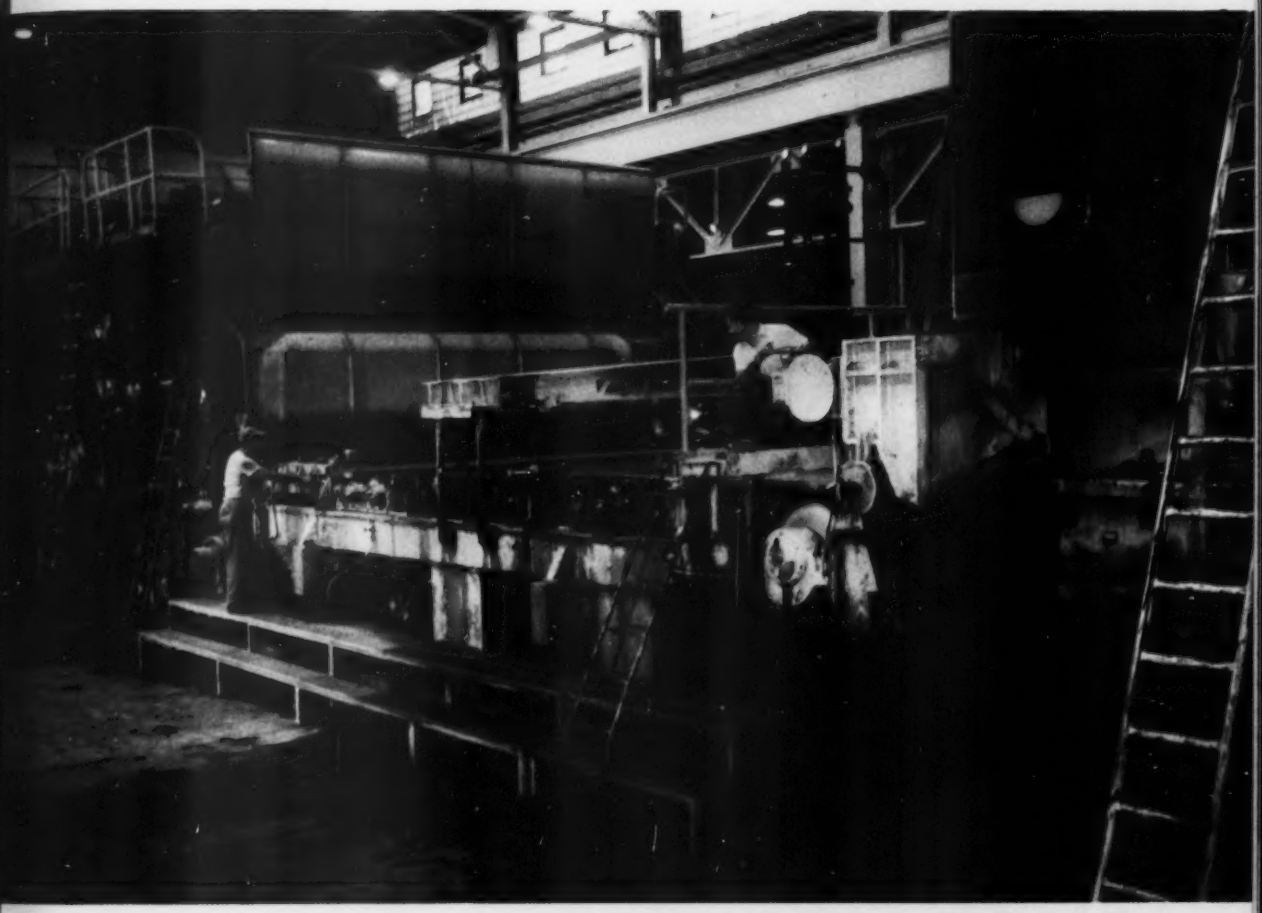
Take another look at your communications

(Editorial continued from page 967)

ects and (3) channeling of this information to the right people, it becomes almost mandatory that a man of senior scientist rank be delegated to the direction of the program.

The problem of communications of course does not end with the company's communications system, no matter how well organized. It is equally important that the publication media that serve a technical industry and disseminate information on a national and international scale be equipped to handle highly technical information material. Editors of such media must have the training and background to enable them to identify and define the basic impact of an industrial communication, interpret results and make them easily recognizable to their readers. While it is recognized that the editor must often of necessity accept the interpretation made at the source of the communication, the fact still remains that the communication cannot be disseminated to best advantage if the editor is unable to cope with the technological aspect of the communication and has to publish it in its entirety in order not to distort the meaning of the communication.

Without effective communications there can be no adequate company or product identification. Since the success of an industrial establishment largely depends on such identification, why not make sure that (1) the communication center functions with the desired efficiency and (2) the disseminating media are more carefully selected so as to achieve a maximum impact of the industrial or technical communication.



Green Bay Plant, No. 9 Machine, Green Bay, Wis. Photo by J. W. Miller

Marathon—a division of American Can Company

This 192″ Yankee tissue machine is the fastest and most modern in the growing and diversified Marathon organization. The first Beloit machine was installed in this mill in 1904. Today, this modern plant has nine Beloit machines in production.—"*Your partner in papermaking,*" *Beloit Iron Works.*

Confidence in the future keynotes 81st APPA meeting

by WARREN B. BULLOCK

J. R. Kimberly, new APPA president

PULP AND PAPER industry executives have recognized the value of constructive leadership in developing a healthy economic sentiment. This was evident at the 81st annual convention of the American Paper & Pulp Association at New York's Waldorf-Astoria February 16-21.

This recognition will in turn be a means of achieving prosperity among U. S. pulp and paper manufacturers. Or, so it was hoped at the meeting, whose central theme was the possibility of strengthening the industry's economic position by an accelerated export trade.

The most important move in this direction was the decision of the American paper industry to reverse its historic position in advocacy of protection and turn instead to support of the Eisenhower Administration's effort to extend the reciprocal trade agreement program and thereby facilitate increased exports of U. S. paper.

More dramatic was the manner in which a New York newspaper phrased this changed attitude when it reviewed the convention in these words:

"The American paper and pulp industry, once an entrenched protectionist camp and a long-time foe of tariff reductions, reversed its position and came out in favor of lowering United States tariffs on a reciprocal basis."

By the board of governors: an historic reversal

This historic reversal came in a meeting of the Board of Governors of the APPA after study of the tariff problem by the Association's tariff committee and the committee on public affairs. The action was followed by an outright advocacy of the Eisenhower Administration's recommendations. This was voiced by Reuben B. Robertson Jr., president of Champion Paper & Fibre Co. and at one time deputy secretary of defense under Secretary Charles E. Wilson.

The action came as the most precise definition of industry policy to be enunciated during the entire convention week and at the conclusion of a week studded with analytical reviews of various facets of the industry's activities.

The potentiality of expanded export trade was stressed as an offset to the declining position of the industry's domestic markets and as a means of closing the gap between the current excess production and diminished demand. To this extent the industry is demonstrating that it has within itself a constructive leadership looking toward the future.

An important fourth-quarter gain

To what extent any upturn in the nation's over-all economy would be reflected in improved conditions in the paper market was frequently discussed in the divisional meetings. The lag between improvement in business generally and the effective result of such an upturn on the paper industry is difficult to measure. According to Morris C. Dobrow, in his analysis of the paper business for the Writing Paper Manufacturers Association of which he is the executive secretary, the present outlook is for further decline in production in the first six or nine months of 1958, as compared with those months of 1956, with the expectation of an important gain in the fourth quarter. Output for the year as a whole, he said, should be about the same as in 1957. An increased capacity of 6 per cent in 1957 over 1956, however, materially widens the gap between potential supply and current demand.

David L. Luke Jr., retiring president of APPA, looks forward toward 1960 as a time when consumption may more nearly approach the increased capacity scheduled for the intervening years. He thought that by 1960 or 1961 the pressure of demand will begin to bend the industry's practical capacity upward. Meanwhile, a moderate excess of capacity over demand creates a healthy spirit of competition within the industry.

Dobrow's estimate of 1958 production of paper and paperboard does not entirely tally with the forecast given by W. LeRoy Neubrech, assistant director of the Forest Products Div. in the Federal Defense Services Administration. Neubrech anticipates an all-time high record for production in 1958 of 31,500,000-32,000,000 tons, an increase to 3-5 per cent above 1957. He foresees an increase in the development of new uses and applications of paper, a field that was almost entirely neglected in the previous several years.

(Turn to page 1008)

Not an unhealthy sign

Still another exponent of the belief in a bright future for the industry was John R. Kimberly, the newly elected president of the association, who said that while in recent months demand had slowed tremendously, the excess capacity shown by the industry's present production rate of 80-90 per cent of capacity was not an unhealthy sign.

John H. Vogel, economist of the APPA, contrasted this rate of output with the current operating rate of the steel industry at 55 per cent of capacity and automobile production, which is off 25 per cent.

Forward-looking trend in exports

The open meetings of the export committee developed the most truly forward-looking trend of the convention. World possibilities were emphasized by various speakers, but the most detailed analysis was presented by Eric G. Lagerloef, secretary of the committee, who had compiled extensive data on the volume of Western Hemisphere imports of paper and paperboard over a 20-year period. His forecast for the Western Hemisphere market in the period 1960-1965 indicated a consumption increase over 1956 of more than 2,000,000 tons. About one-third of this amount will have to be met by imports. In the 20-year period beginning in 1937 the Latin American region increased its imports of paper and paperboard from the United States from 150,000 tons, 25 per cent of the total requirements, to 521,000 tons, 50 per cent of the total import requirements.

George Cobean, a special consultant to one of the large paper companies, said that Latin America was the most promising field for United States exporters as political conditions in most of the Far East make trade somewhat difficult in that area. He said that in South America the United States has succeeded in displacing European competition to a considerable extent in certain markets "around which the spiked fences of our competitors kept us out for generations".

Philip D. Allen, director of the European Division of the Bureau of Foreign Commerce of the Department of Commerce, said that the new European Economic Community offers a market expansion in which the United States paper industry would appear to be one of those most likely to benefit.

In newsprint a recurring problem

The recurring problem of over-capacity in the newsprint industry was one of the areas in which the business set-back was discussed most pointedly. Arthur G. Wakeman, retiring president of the Newsprint Service Bureau, expressed concern over the rising costs of newsprint production, saying these mills were experiencing another "profit squeeze". Charles F. Honeywell, secretary of the bureau, discussing "Business-Government Relations", pointed out how governmental attacks have hampered the industry. He said that the newsprint industry had been under government investigation 16 times in 14 years. The reduction of its dividend by Great Northern Paper Co., announced during the week, was not so much due to depressed business conditions in the industry as to its own problem of short water supply in the Maine area where its mills are located.

Water: vital to the industry

The question of water supply, so important to a single company, was one of the topics at the annual open industry session, when John G. Strange, president of the Institute of Paper Chemistry, in discussing the relationship of water to the paper industry said that it is axiomatic that the future of the paper industry is dependent upon the continuous and expanding development of the nation's woodlands, but that 47,000 sq. mi. of industry forests provide a run-off of more than seven times the volume which is used in manufacturing operations. Intelligent handling of watersheds in the public interest, he said, is important to the industry as well as to the rest of the nation's economy.

While the over-all tones of the convention this year reflected the downward business trend, it closed with a unanimous expression of confidence in the future.

APPA: the solid grounds for optimism

THE "SOLID grounds for optimism" were strongly emphasized during Paper Week by David L. Luke, retiring president of the American Paper & Pulp Association, as he addressed the APPA's annual Open Industry Meeting.

Speaking at the Waldorf-Astoria Hotel, the president of West Virginia Pulp & Paper Co. declared that, "I am optimistic because I see working before me right now the fundamental economic forces that will cure our present troubles".

Commenting on the wood pulp capacity expansion plans that were on the boards a year ago, the speaker said, "Such a rate of expansion would have been about twice the average rate of our normally vigorous growth in demand . . . . The creation of such a degree of excess capacity would have been a wasteful use of the country's economic resources, as well as a disastrous policy for the companies of our industry".

Luke expressed admiration that the leaders of the industry and its trade associations foresaw the folly of such expansion. "The best estimates", he said, "indicate that the members of the industry on the North American continent cancelled or deferred about 5,000,000 tons of annual pulping capacity, and that they stretched out their plans for many more thousands of tons of projected pulp and paper capacity to cover a longer period of time than was contemplated a year ago".

Realistic economic balance

At a convention that emphasized quality, competition and service as priority features in the industry's immediate growth, the APPA went to the Midwest for its 1958-59 leader. Last year's first vice president, J. R. Kimberly, chairman of the board of Kimberly-Clark Corp., took over the reins at the Open Industry Meeting.

He succeeds Luke.

The new first vice president is H. E. Whitaker, chairman of the board of Mead Corp., Dayton, Ohio.

Keynoting his address, Luke declared, "Beneath the surface of our reduced activity today we are laying the basis for recovery".

"If net demand continues to grow at the projected rate, then along about 1960-61 the pressure of demand will begin to bend our practical capacity upward toward the curve that represents capacity on the historical basis."

(Turn to page 1010)

200 GPM +400 GPM 600 GPM

The PLUS value of Layne Gravel Wall Wells

400 GPM more water delivered by the use of a Layne Gravel Wall Well

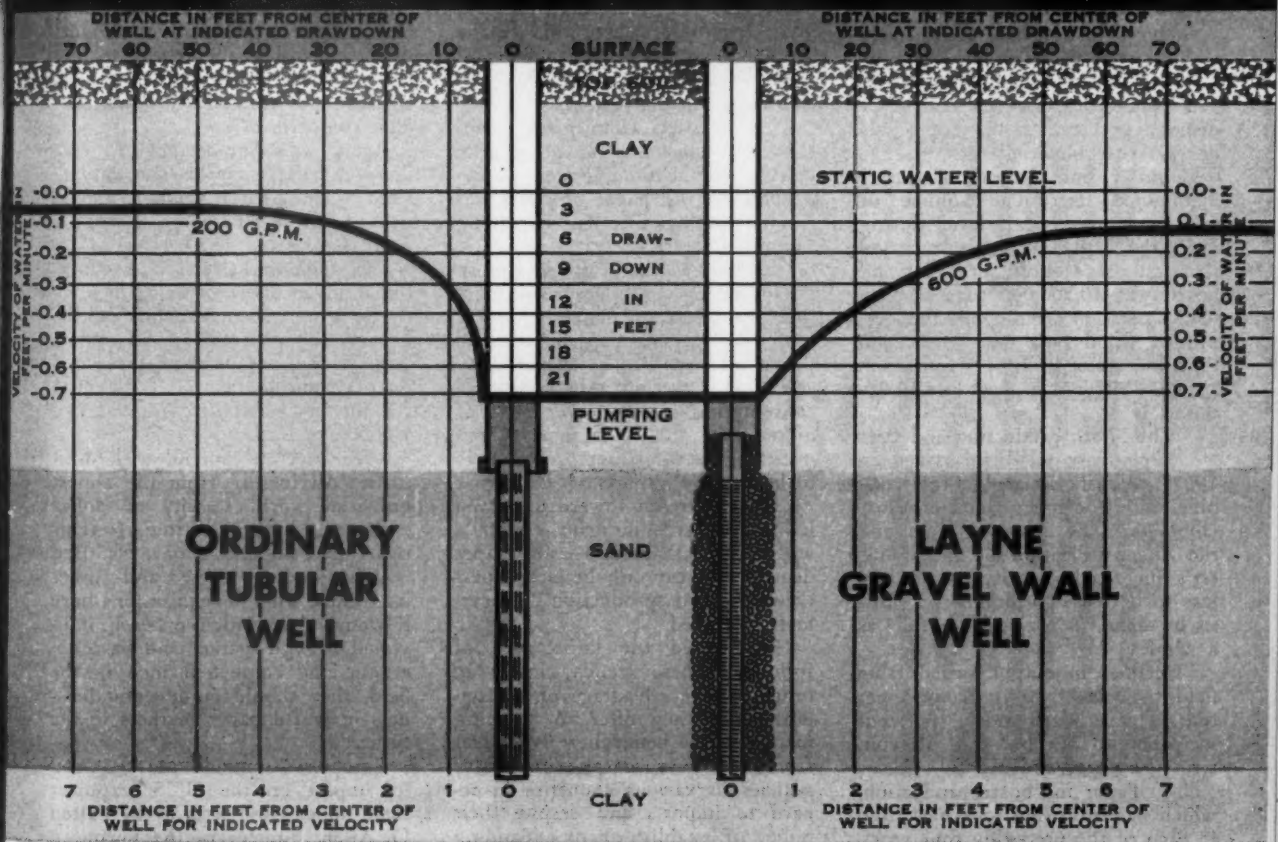
Paper and pulp operations demand ample water supply and economy is a prime consideration. Here Layne gravel wall wells prove superior.

Layne underreamed gravel wall wells equipped with Layne screens permit large screen openings which allow greater inlet velocities and reduce friction which in turn reduces wear on the shutter screen. Drawdown is moderate, pumping head low and operating costs proportionately lower.

Layne gravel wall wells are another example of Layne's experience and leadership in the field—gained around the world for over 75 years.

Our only concern—our only business is water.

PRODUCTION AND OPERATING CHARACTERISTICS OF TWO TYPES OF WELLS.



Layne

LAYNE & BOWLER, INC., MEMPHIS

General Office and Factory — Memphis 8, Tenn.

Layne Associate Companies throughout the world.

Water Wells • Vertical Turbine Pumps • Water Treatment

LAYNE & BOWLER, INC., Memphis 8, Tenn.

Gentlemen: Please send me bulletin No. CW-9.

NAME_____

TITLE_____

ORGANIZATION_____

ADDRESS_____

CITY_____ STATE_____

AT THE OPEN MEETING on community relations (l to r): Walter J. DeLong of Weyerhaeuser Timber Co.; T. F. Spear of Oxford Paper Co.; Charles E. Allen of Crown Zellerbach Corp.; John L. Tower of International Paper Co., and Samuel Shane of St. Regis Paper Co. The theme of the discussion: good internal relations means good external relations.

EXPORTS WERE THE subject of these men at the APPA meeting (l to r): Eric G. Lagerloef, secretary of the APPA export committee; A. J. Parreno of Curtis, Mallet, Prevost, Colt & Mosle; P. D. Allen, U. S. Department of Commerce; George Cobean, Champion Paper & Fibre Co., and Dana Pratt, president of Champion Paper Corp. S. A.

31,200,000 tons in 1958

In his annual review of the pulp and paper industry, John H. Vogel foresaw a 1958 output of about 31,200,000 tons, "if the revival of demand expected in the latter half of this year materializes".

Pointing out that the industry maintained its dollar volume of sales at almost peak level during 1957, the APPA economist reported that last year's output of paper and board was 30,700,000 tons, a drop of 2.3 per cent from 1956. The output of wood pulp was 21,800,000 tons, a decrease of 1.5 per cent from 1956 — history's highest in all categories.

"While both production and sales were relatively well maintained in 1957", Vogel declared, "the combined effect of rising transportation, labor and raw material costs and the under-utilization of the industry's increased capacity to produce was to decrease the industry's profits by about 18 per cent for 1957 as a whole.

"Declines in output varied from field to field, ranging from 1 per cent in paperboard and 2.7 per cent in paper to 6.5 per cent in construction paper and board.

". . . Paper and board production, which had advanced to a new high in each of the preceding four years, declined in 1957 because the paper industry — in common with other industries —experienced an easing of demand for its products at the mill level. Although the output was 2.3 per cent less than in 1956, it nevertheless represented the second best year in the history of the industry."

An annual highlight of the APPA convention is the meeting of its export committee, where this year a bright picture for the future was drawn by experts in the field.

Growing export markets

That Western Hemisphere countries are continuing to grow as a market for United States paper, paperboard and paper products was emphasized by Eric G. Lagerloef, committee secretary.

Countries in the Western Hemisphere during 1956 absorbed more than 70 per cent of U. S. world trade in paper, paperboard and paper products. Projections for 1960 and 1965, Lagerloef said, indicate a consumption increase over 1956 of more than 2,000,000 tons. About one-third of this increase will have to be met by imports.

"Marked trends toward improved living standards in many countries will bring with them a rising paper demand that can only be met in part through local production", Lagerloef continued.

He stressed the importance of following these trends closely in order to take advantage of the opportunities they offer. A growing market in the hemisphere is evident from the data, despite restrictive policies in various countries in regard to imports and despite their policy of establishing or expanding their own production facilities.

Still another aspect of the export market was covered by Albert J. Parreno, partner in the firm of Curtis, Mallet-Prevost, Colt & Mosle.

In a talk entitled, "Profit Sanctuaries", Parreno declared that, "the intelligent use of Western Hemisphere trade corporations and of foreign sales, manufacturing or holding corporations can save (pulp and paper firms) substantial amounts of taxes and enable them to use these savings to expand activities abroad and successfully meet foreign competition".

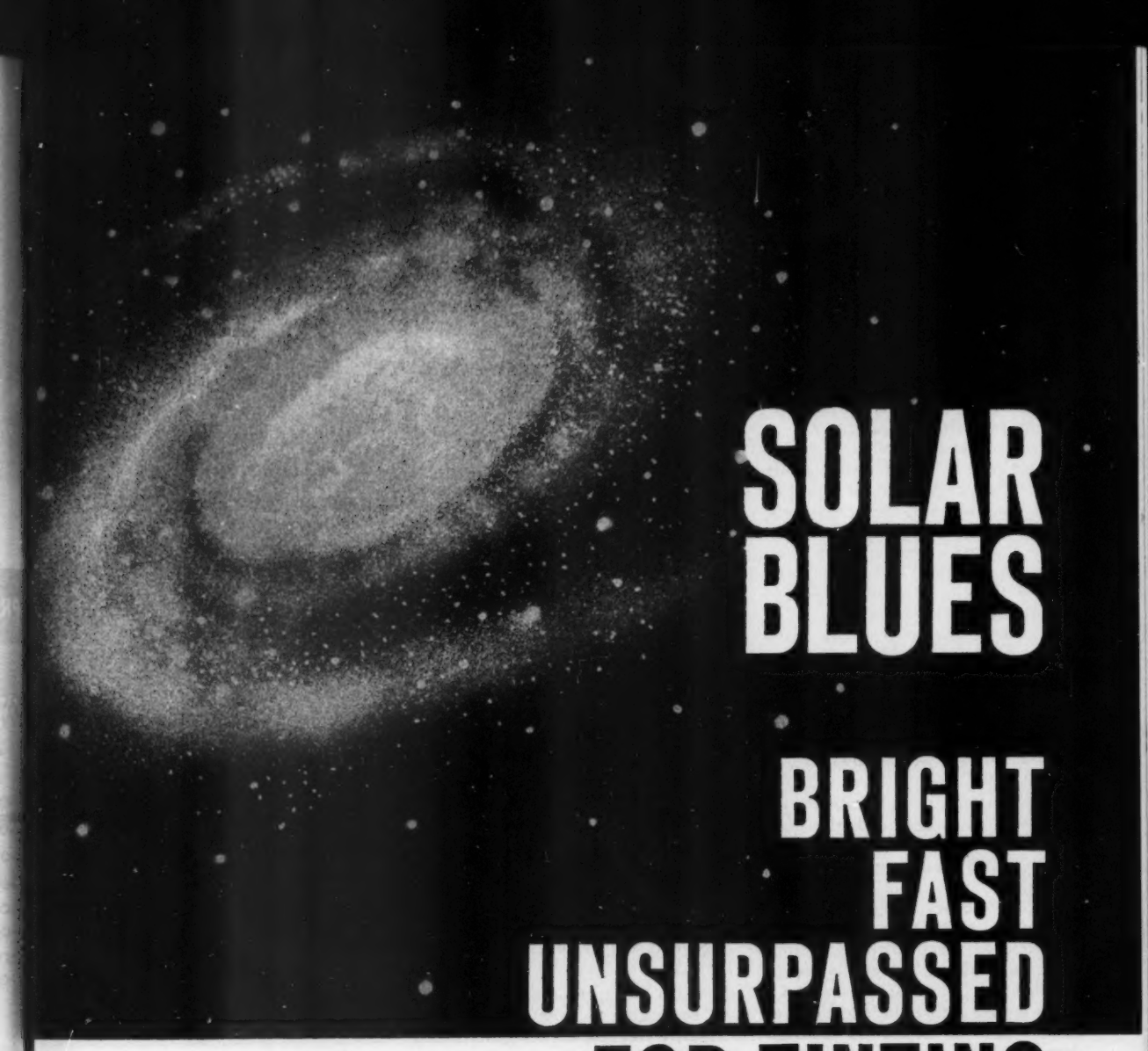
Again the importance of the South American market was emphasized when George Cobean, special consultant to Champion Paper & Fibre Co., said:

"As industrialization and educational advances are occuring in practically every country south of the border, the demand for all papers is increasing notably; and these two factors indicate that . . . the need for increased imports from abroad will occur . . . .

"We have to contend with difficulties originating from the almost universal world scarcity of dollar exchange, higher marine freights than our competitors pay, etc. But, notwithstanding these and other handicaps, where organizations have thorough knowledge of each individual foreign market and have energetic and competent men in the field, they should enjoy good business in world paper markets in the future."

Europe's "Common Market" and its impact on the U. S. exporter came under close scrutiny by Patten D. Allen, director of the European Div. of the Bureau of Foreign Commerce in the U. S. Department of Commerce.

"The Common Market countries", he said, "intend to establish their external tariff (with some exceptions) at the level of arithmetic averages. They have made it clear, however, that the resulting duties will remain subject to reduction by re-



SOLAR BLUES

BRIGHT FAST UNSURPASSED FOR TINTING WHITE PAPER

From Research to Reality

gdc gaf

GENERAL DYESTUFF COMPANY

A SALES DIVISION OF

GENERAL ANILINE & FILM CORPORATION

435 HUDSON STREET · NEW YORK 14, NEW YORK

CHARLOTTE · CHATTANOOGA · CHICAGO · LOS ANGELES · NEW YORK
PHILADELPHIA · PORTLAND, ORE. · PROVIDENCE · SAN FRANCISCO

SOLAR BLUE DYES MANUFACTURED BY THE GENERAL ANILINE & FILM CORPORATION ARE SOLD OUTSIDE THE UNITED STATES UNDER THE TRADEMARK "TINTOFEN."

ciprocal concessions. Under these conditions it seems to me that each exporter and would-be exporter of pulp and paper products to the Common Market — or even to western Europe as a whole, since a free trade area may soon be established — has a personal stake in continuing our ability to negotiate reciprocal tariff reductions."

Market analysis

A broader concept of market analysis was described at the joint open meeting of APPA's committees on markets and statistics.

This broader concept is based on a wide knowledge of many fields together with the use of applications research in the expanding paper market.

The principal speakers were two scientists: Dr. B. D. Thomas, president of Battelle Memorial Institute of Columbus, Ohio, and Dr. E. E. McSweeney, manager of the institute's chemistry department.

Dr. Thomas told the delegates that, "Important market factors may originate in areas remote from the industry, and good market analysis today requires a wide knowledge of many fields".

While attention is centered on the market, he continued, the market may change for a variety of technological and psychological reasons.

Dr. McSweeney turned his attention to the further development of this concept. That further development, he said, can materially aid in broadening the industry's markets.

He reported that the chemical industry has developed to a high degree the concepts of applications research to stimulate its marketing effort.

"A well-defined technique that serves many diverse types of chemical firms has resulted", he said.

Quotes from the Waldorf

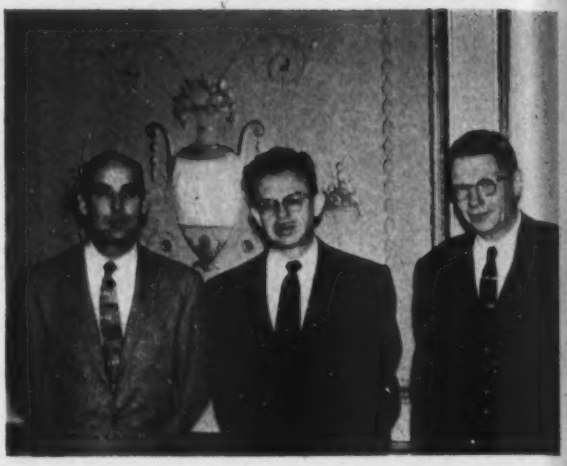
Much is said and much is predicted during Paper Week at the Waldorf:

▸ Businessmen were advised to spend more time and effort in political action by **Donald G. Hardenbrook**, vice president of Union Bag-Camp Paper Corp.

"Today, more than ever before", he said, "our day-to-day lives are vitally affected, even controlled, by what takes place in the halls of Congress."

▸ Speaking at the annual Open Industry Meeting, **Reuben B. Robertson Jr.**, president of Champion Paper & Fibre Co., urged support for President Eisenhower's defense, mutual security and reciprocal trade programs.

The former deputy secretary of defense declared that a five-year extension of the reciprocal trade program is essential because, "we can't sell our products abroad unless we are receptive to their products".



MARKETING AND STATISTICS was the topic of these men (l to r): Dr. E. E. McSweeney of Battelle Memorial Institute; Dr. B. D. Thomas, president of Battelle, and Dwight L. Stocker, president of KVP Co.

▸ "Production of thin paper specialties made a new high record in 1957", according to **M. C. Dobrow**, executive secretary of the Writing Paper Manufacturers Association.

"This was contrary", he said, "to the trends in the rest of the industry, which showed a small decline. Thin paper production increased 2½ per cent over production in 1956 and was 15 per cent above that of 1955."

▸ Prices of paper products will tend to be steady to higher despite the industry's excess capacity, according to **David L. Luke**.

The president of West Virginia Pulp & Paper Co. and retiring APPA president declared that price declines in previous periods of overcapacity had occurred when, "the balance of the industry was repeatedly upset by sudden huge enlargements of the supplies of market pulp . . . . Today conditions for such disruptive changes do not prevail".

"Another fundamental economic force" tending to produce higher prices, he said, is the industry's heavy investment.

▸ Again **Dobrow** of the Writing Paper Manufacturers Association: "There was no growth in 1957. Business was about as good as it was in 1956. The first real signs of a recession appeared in the fourth quarter of 1957. It is not likely to be of long duration . . . As soon as excess inventories are liquidated, as soon as there is a balance between production and demand, our industrial machine will be ready to go forward again".

▸ That "good internal communications benefits good external communications" was the view expressed by **Samuel Shane** at the meeting of the APPA community relations committee.

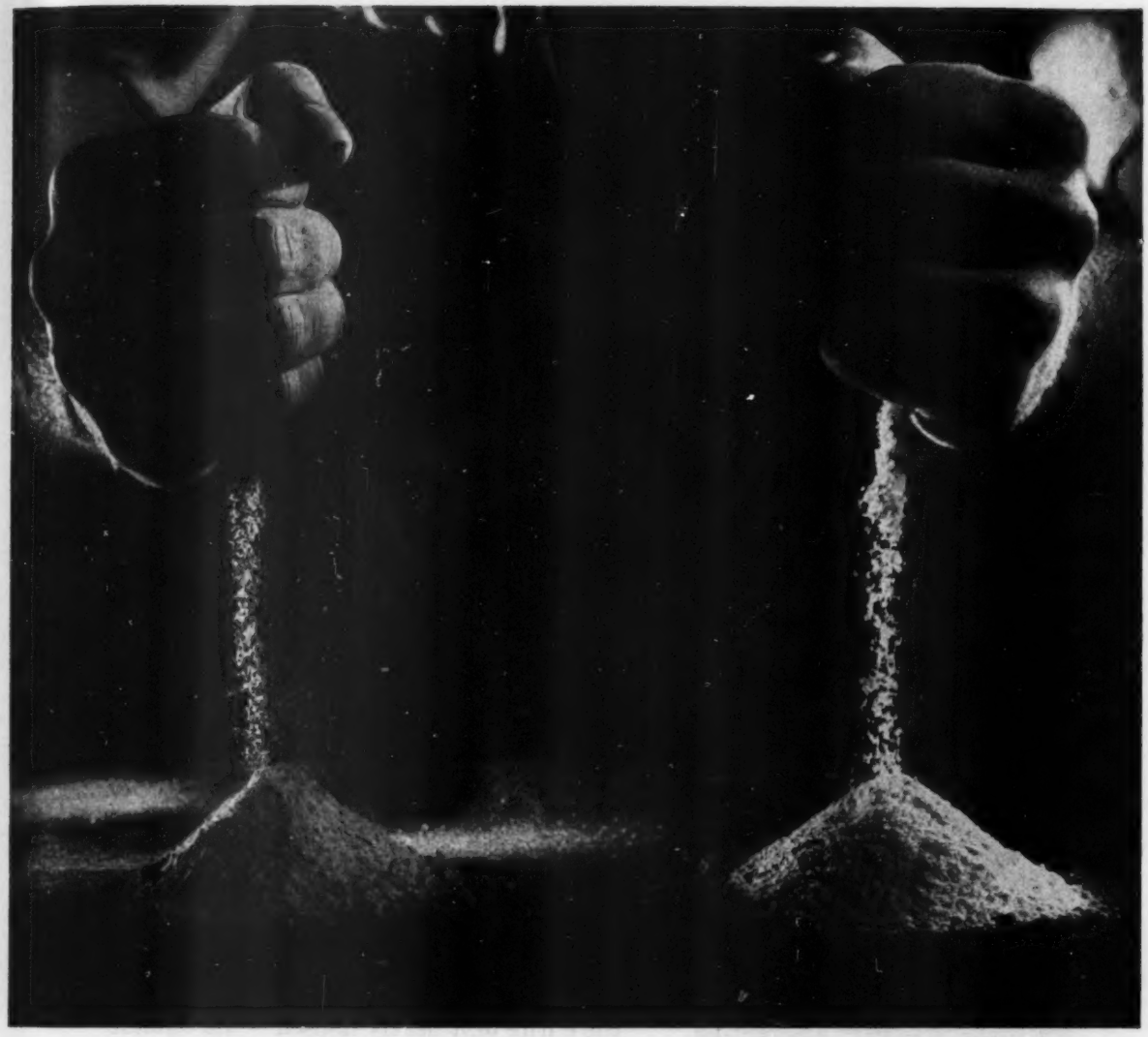
The public relations director for St. Regis Paper Co. called for a "fair and considered presentation" in editing for employees.

▸ And again the retiring president of APPA, **David L. Luke**, who said, "In my humble judgment our temporary set-back — painful though it may be — can and will serve as a springboard for the opportunities that so surely lie ahead".

New vice presidents

Vice presidents named at the New York meeting to serve in the 1957-58 year are as follows:

W. R. Adams, president of St. Regis Paper Co.; **M. D. Bardeen**, president of Lee Paper Co.; **Alexander Calder Jr.**, president of Union Bag-Camp Paper Corp.; **Hugh J. Chisholm**, board chairman of Oxford Paper Co.; **R. C. Doane**, president of International Paper Co.; **J. B. Faegre**, board chairman of Minnesota & Ontario Paper Co.; **M. C. McDonald**, president of Great Northern Paper Co.; **J. L. Madden**, vice president of Scott Paper Co.; **C. B. Morgan**, president of Rayonier Inc.; **George E. O'Connor**, president of Mohawk Paper Mills Inc; **Reuben B. Robertson Jr.**, president of Champion Paper & Fibre Co.; **Samuel R. Sutphin**, board chairman of Beveridge Paper Co.; **John Stevens**, vice president of American Can Co.; **G. J. Ticoulat**, senior vice president of Crown Zellerbach Corp., and **R. W. Wortham Jr.**, executive vice president of Southland Paper Mills Inc.



Now—enjoy all the sizing power of Mersize in new low-dusting form

To give you the most for your sizing dollars, Monsanto's exclusive drum-drying process now turns out Mersize RM Dry in a new low-dusting, free-flowing particle. Mill men say they like new Mersize RM Dry because it resists caking, cuts fly loss and causes less irritation than dry powder sizes. You get the full, dependable sizing power Mersize is known for—and more, because virtually every grain goes into your furnish.

New, low-dusting Mersize RM Dry comes packaged in bleached kraft paper so white you can drop bag and all into the beater without fear of discoloring the stock. When you order, it's shipped fast from one of Monsanto's modern plants or strategically located warehouses. These are concrete reasons why 9 out of every 10 mills that have given Mersize a thorough trial have become steady users. If you aren't already using Mersize . . . we suggest you take a look at low-dusting Mersize RM Dry, today.

Mersize—T.M. Monsanto Chemical Co.

Monsanto

WHERE CREATIVE CHEMISTRY WORKS WONDERS FOR YOU

MONSANTO CHEMICAL COMPANY
Organic Chemicals Division
Dept. PC-1, St. Louis 24, Missouri

I want to see new Mersize RM Dry . . . please send a sample.

NAME.....*TITLE*.....

COMPANY.....

ADDRESS.....

CITY.....*ZONE*....*STATE*.....

NOW PRESS FELT CONDITIONING TO MATCH MODERN, HIGH SPEED PAPER MACHINES

with the

1958 MODEL VICKERY FELT CONDITIONER

Close-up of one of the conditioning boxes on this Vickery Felt Conditioner. Warm water goes through the felt and back in several "hairpin" turns as the felt travels along the shoe. More water can be sprayed into the felt and higher vacuum employed without wrinkling the felt even at the highest speeds.

The new *hydraulic drive* permits operation by the remote control panel shown at the left.

The new *traveling header* design keeps the entire unit neatly housed — no outside hoses, no header projections beyond the paper machine frame. This design is especially advantageous where space is limited or where the felt runs directly beneath the Conditioner.

The vacuum boxes are adjustable for trim of felt as well as vertically.

Write for full information, recommendations and layouts.

BIRD MACHINE COMPANY

SOUTH WALPOLE, MASS.

REGIONAL OFFICES: EVANSTON, ILLINOIS
PORTLAND, OREGON • ATLANTA, GEORGIA

Canadian Manufacturers of Bird Machinery
CANADIAN INGERSOLL-RAND COMPANY, Limited, Montreal

CURRENT COMMENTS

The tariff and prosperity . . . an historic cycle . . . and ski chauffeur

by WARREN B. BULLOCK

While Canada is so prosperous that its dollar in 1957 was worth from 1.01 to 1.05 in United States dollars, the United States—already the lowest duty rate country in the world—proposes to cut its duty rates more sharply than ever before. Canada, on the other hand, has the highest duty rates of any major nation. For instance, in the case of paper, its rates are from two to three times the United States rates on comparable grades. Whether a protective tariff is responsible for Canada's prosperity is a question for the economists.

One of the most important legislative problems of the current session of Congress, outside of Sputnik and related matters, is the Eisenhower administration's tariff-cutting program, which was introduced in February. Inasmuch as the two senior ranking Republican members of the Ways & Means Committee of the House of Representatives refused to sponsor their President's proposals, the actual introduction was left to lower ranking Republicans and the Democratic chairman of the committee. The industrially-developing South is more likely to oppose the sweeping nature of the Administration proposals than the members of the President's own party, and some observers think the most the Administration can get from Congress is a trimmed-down one-year authority for tariff rate reductions instead of the five-year program requested.

The Administration measure asks for a five-year authority to reduce duty rates, applicable under two alternative conditions: Rates to be reduced 5 per cent of the current rates each year for five years (in three years if no annual reduction is over 10 per cent); when the present duty rate is not over 12 per cent, 3 percentage points in three years. In the case of commodities dutiable at a specific rate —say 2 cents per pound—this figure will be converted to an ad valorem basis by the United States Tariff Commission, applying the 2-cent figure to the average value and weight of the commodity. In the case of printing paper, for instance, now dutiable at 0.18 cents per pound plus 4½ per cent, the equivalent ad valorem rate is slightly under 7 per cent. Under the proposed bill this rate could be cut to 4 per cent over a three-year period. Canada, the principal shipper of this grade, imposes a duty rate of 22½ per cent. The premium of the Canadian dollar over the United States dollar, however, would be the equivalent of an additional United States duty in proportion to the value of the Canadian dollar, or at current exchange about 1½ per cent.

The original concept of the Reciprocal Trade Agreement program was that no rate of duty would be reduced more than 50 per cent at any one time. The printing paper rate would be susceptible under the proposed program to a reduction of 60 per cent. Hanging raw stock, now dutiable at 4½ per cent, could be reduced to 1½ per cent, or a cut to one third of the present rate.

Trimmed to a shell

Inasmuch as similar radical reductions on various commodities appear throughout the entire tariff schedule, the opposition of many industries may well block the Administration program, or at least trim it to a shell of the current proposal.

North American newsprint production in 1957 reached an all-time high of 8,222,611 tons, the large bulk of the total being for United States newspapers. This included an increase in United States production of over 100,000 tons, but a decrease of Canadian output of 36,000 tons. Current newsprint demand was filled without recourse to a possible heavier capacity of 700,000 tons, and the unused capacity in 1958 is estimated at 1,000,000 tons over the presumable demand. Thus the newsprint manufacturing industry has passed into one of its historic cycles of over-capacity following periods of newsprint shortages.

Boom south of the border

The development of paper manufacturing industries in Latin America was highlighted the past month by the W. R. Grace & Co. announcement of the formation of Grace Paper Co. to administer the parent organization's $50,000,000 expansion program in the southern republics. The company already has paper manufacturing and converting enterprises in Brazil, Colombia, Peru, Puerto Rico and Cuba. Other American interests are also planning large expansion in such republics as Brazil. Wentworth Brown, well known in the paper industry, has been named president of Grace Paper.

Special handling

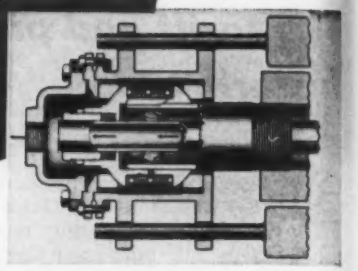
The Atlantic Coast Line Railroad has adopted a unique plan to serve the rapidly growing southern paper industry. It has ordered 300 cars with a neoprene surface to supplement its present fleet of 100 such cars. The neoprene facing will be on a steel lining for freight cars and applied before the steel is used in the construction operations. The need for special handling of newsprint and kraft is based on the weight of the rolls, which must be protected from rough walls and floors, as well as on the need for the strength required because of this weight, often over a ton each.

The immunity of government

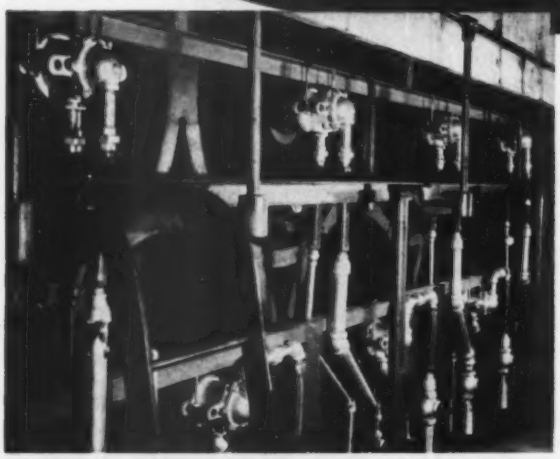
Doeskin Products has been in the news in the last few weeks as a result of the complications of its affairs with those of an oil company that holds much of its stock. Leon Henderson, former chief of the wartime Office of Price Administration, is its current president. The United States Federal Court at New York has dismissed Doeskin's suit for $1,000,000 against the Securities & Exchange Commission and three of the Commission's

For paper machine dryers with rotating syphon pipes

Type LN JOHNSON JOINTS



Cross section view of Type LN. Inlet is in side of body; outlet can be as shown or with angle head as in installation views.

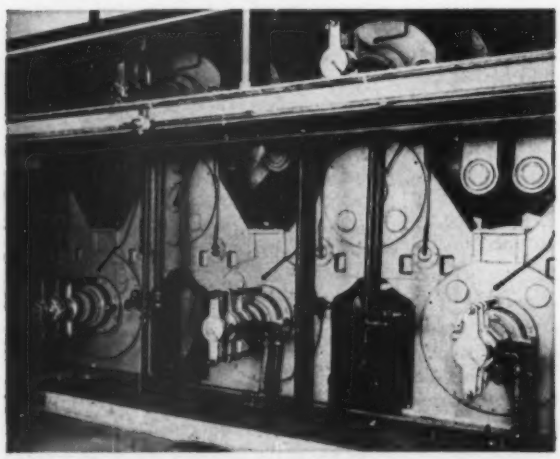


Type LN Johnson Joints on paper machine with exposed gearing. Support rods are hung from framing.

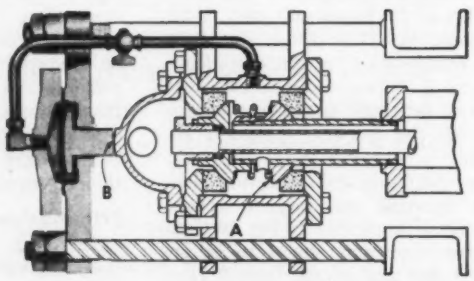
SYPHON PIPES that must rotate with the dryer roll require a specialized type of steam joint. The Johnson Type LN answers the problem neatly enough by accommodating the syphon pipe as an integral part of the rotating assembly. The pipe is still permitted longitudinal movement; the Johnson Joint requires no lubrication or adjusting.

The mounting of the Type LN provides a "floating action" that assures maximum service life. Simple rods, which fit into lugs cast on the joint body, carry all the weight of the body and connections. The sealing mechanism floats freely inside.

Months and even years of service without a bit of attention have proved the Type LN the best steam fit yet devised for this service. A trial joint installation can be arranged in your own mill, without any obligation on your part.



Type LN Johnson Joints on machine with enclosed gearing. Support rods are fitted to bosses provided by machinery manufacturer. Installation includes Compensators (see right).



The Johnson Load Compensator

Developed in response to increasing operating speeds and pressures. Teams up with the LN Joint; mounts on same support rods. Utilizes pressure within joint to exert a force against joint body, which in turn reduces friction load at the seal ring. Cuts power needs of joint in half; doubles seal ring life; slashes down time and maintenance.

Products of The

845 Wood St., Three Rivers, Mich.

Rotary Pressure Joints • Compressed Air Separators and Aftercoolers
Direct Operated Solenoid Valves • "Instant" Steam Water Heaters

Current Comments . . .

attorneys. Doeskin charged that as a result of the SEC activities it was forced to sell more than 1,000,000 shares of its stock at $2 per share, instead of a planned sale at $2.50. The court held that agents of an administrative arm of the government are immune to personal suits when acting under the color of authority.

Not for profit

J. P. Lewis, head of J. P. Lewis Paper of Beaver Falls, N. Y., has a new enterprise—not for profit—based on his love of skiing. He is acting as a bus driver to chauffeur ski parties each week-end to the snow slopes of the northern Adirondacks. "Ride the Sky-Way Route" is the sign on the bus that he bought for this enterprise. Lewis wears a bus driver's cap and jacket on his trips but could wear a chef's white cap if he wished, for his bus is equipped with a steam table to handle 60 hot dogs at a time.

The road back

Income reports now being released by various paper companies for the 1957 complete year indicate that fourth quarter earnings in several cases show that net returns had ceased to drop as compared with the previous three quarters. In the case of St. Regis, for instance, the net income decreased in the first three quarters by over $5,000,000 as compared with 1956, but the decrease for the complete year was only $4,350,000. In other words, the paper industry, to judge from this and some other reports, is on the way back.

Financial Reports

Paper mill securities showed considerable strength between January 10 and February 10, practically every quoted issue recording an advance over the first-of-the-year prices. Growing optimism seemed to be independent of a somewhat pessimistic sentiment in some branches of industry.

Net Incomes

American Box Board Co.—Net in 1957 was $2,070,665 as compared with $2,391,002 in 1956.

American Can Co.—Net income in 1957 totaled $45,369,139, including income from Marathon and Dixie Cup. Sales, including the two newly acquired paper companies, passed the billion-dollar mark.

Brown Co.—Net income for the year ended November 30 was $2,080,305 as compared with $2,611,504 in 1956.

Celotex Corp.—Net earnings for the year ending October 31, 1957, were $3,883,858 as compared with $5,902,284 in the preceding fiscal year.

Chesapeake Corp. of Virginia.— Net income for 1957 was $3,720,473, an increase over the 1956 figure of $3,354,435.

Container Corp. of America.—Net income was $14,589,692 in 1957 as compared with $18,230,919 in 1956.

Crown Zellerbach Corp.—Net income in 1957 dropped to $38,051,000 from the 1956 net of $50,048,000.

Eastern Corp.—Net profit in 1957 was $1,129,000 as against a net in 1956 of $1,650,000.

KVP Co.—Net income for the quarter ending December 31 was $720,877 as compared with $932,737 for the comparable quarter in 1956.

Keyes Fibre Co.—Net income in 1957 climbed to $1,564,150 from the 1956 total of $1,255,272.

Longview Fibre Co.—Net earnings for the year ending October 31 were $8,748,043 as compared with $8,904,355 in the previous fiscal year.

Minnesota & Ontario Paper Co.—Net income in 1957 was $5,950,000 as compared with $7,744,917 for the previous year.

Nekoosa-Edwards Paper Co.—Net income in 1957 was $3,000,715 as compared with $7,744,917 for the previous year.

Oxford Paper Co.—Net income for 1957 was $3,360,000 as compared with $4,644,275 in 1956.

Rayonier Inc.—Net income in 1957 totaled $6,250,000 as compared with $13,969,132 in 1956.

New Haven Board & Carton Co.—Loss for the year to September 20, $321,807; for the prior fiscal year, a profit of $299,337.

Stock and Bond Quotations

New York Stock Exchange — Stocks

Closing Prices	Feb. 10, 1958	Jan. 10, 1958
American Can	42⅜	42½
Celotex	31	30
Same Pref.	18⅛	18½
Certain-Teed	9⅛	9¼
Champion P & F	36½	*34½-35
Same Pref.	*98½-100	*91-93¼
Chesapeake	27½	24⅜
Container	18¼	17½
Same Pref.	*91-93	*96¼-88
Continental	43⅞	41⅞
Crown Zellerbach	47¼	44⅜
Same Pref.	98¾	96½
Diamond-Gardner	28½	26⅛
Eastern	*18¾-19¼	18½
Federal Paper Board	31¾	30¾
Same Pref.	*20-20¼	*19¼-19½
Fibre Paperboard	24¾	21½
Same Pref.	84¼	*82-87
Great Northern	47½	50⅛
Hammermill	24¼	22⅞
International	91¾	86¼
Same Pref.	94½	*91-96
Kimberly-Clark	50	47½
MacAndrews & Forbes	28½	24
Masonite	28⅜	27¼
Mead	36¾	35¼
Same Pref.	*92-94½	*86-89
Minnesota & Ontario	24⅛	22½
Oxford Paper	29	26½
Same Pref.	*90-92	88
Rayonier	16⅜	14⅝
Riegel	23	21⅜
St. Regis	30¾	27⅜
Same Pref.	*91½-93	91½
Scott	58	58⅜
Same $3.40 Pref.	82½	*78½-79½
Same $4 Pref.	*96-98½	*93-96
Sealright	*26-26½	25¾
Sutherland	32⅜	33¼
Union Bag-Camp	32¾	33¼
United Board & Carton	*20⅛-20⅞	19
United Wallpaper	* 7⅛-7½	6¾
Same Pref.	*14-15½	*13-14½
U. S. Gypsum	73½	65⅜
Same Pref.	169	*167½-170
West Va. Pulp & Paper	34⅛	37
Same Pref.	99	*93-99

New York Stock Exchange — Bonds

A.P.W. Products 5¾	—	76
Champion P & F 3¾%	—	93½
Champion P & F 3%	93	90
Mead 3%	—	—
Scott 3%	99	97⅛

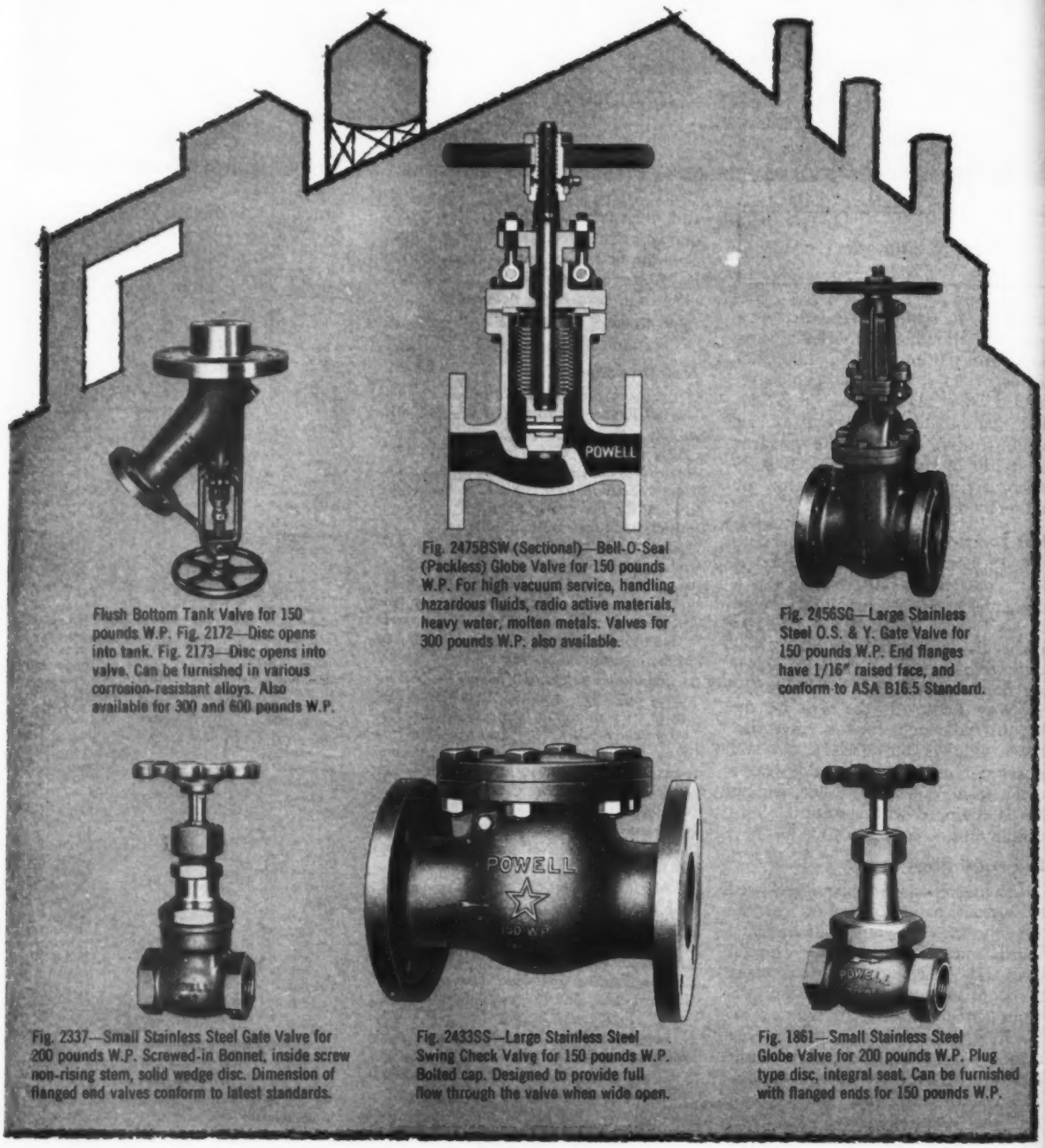
American Stock Exchange — Stocks

Allied	8¼	6½
American Writing	20	19
Brown	10	10¼
Puget Sound	14½	14

*Closing Bid and Asked Prices.

POWELL

world's largest family of valves



Flush Bottom Tank Valve for 150 pounds W.P. Fig. 2172—Disc opens into tank. Fig. 2173—Disc opens into valve. Can be furnished in various corrosion-resistant alloys. Also available for 300 and 600 pounds W.P.

Fig. 2475BSW (Sectional)—Bell-O-Seal (Packless) Globe Valve for 150 pounds W.P. For high vacuum service, handling hazardous fluids, radio active materials, heavy water, molten metals. Valves for 300 pounds W.P. also available.

Fig. 2456SG—Large Stainless Steel O.S. & Y. Gate Valve for 150 pounds W.P. End flanges have 1/16" raised face, and conform to ASA B16.5 Standard.

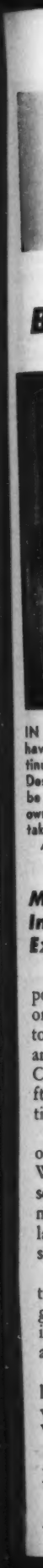
Fig. 2337—Small Stainless Steel Gate Valve for 200 pounds W.P. Screwed-in Bonnet, inside screw non-rising stem, solid wedge disc. Dimension of flanged end valves conform to latest standards.

Fig. 2433SS—Large Stainless Steel Swing Check Valve for 150 pounds W.P. Bolted cap. Designed to provide full flow through the valve when wide open.

Fig. 1861—Small Stainless Steel Globe Valve for 200 pounds W.P. Plug type disc, integral seat. Can be furnished with flanged ends for 150 pounds W.P.

For every flow control problem Powell offers more kinds or types, available in the largest variety of metals and alloys to handle every flow control requirement. Powell distributors are located in all principal cities and maintain inventories to fill almost any need. For special engineering problems, write direct to:

THE WM. POWELL COMPANY • *Dependable Valves Since 1846* • **Cincinnati 22, Ohio**



NEWS of the INDUSTRY

Brown Installs Continuous Digester at Berlin Pilot Plant

IN A COOPERATIVE project, Brown Co. and Black-Clawson Co. have installed a complete three-tube Pandia Chemi-Pulper continuous digester system at Brown's pulp pilot mill in Berlin, N. H. Designed for wide-range pulping investigations, the new unit will be operated part of the time by the New Hampshire firm for its own studies of continuous pulping; Black-Clawson will also undertake experimental work with the equipment.

Available are a stationary batch digester, a pulp bleaching system, a stock preparation system and a pilot paper machine.

The Pandia system is adaptable to the pulping of agricultural residue fibers as well as wood fiber. The unit comprises a 7½-in. screw feeder, three 18-in. digester tubes, one 18-in. discharger equipped with two blow valves and a 30-in. live bottom blow tank.

Shown above are (l) the Pandia chip feeder drive and (r) the horizontal cooking tubes, where wood chips and other fibrous materials are reduced to papermaking pulp in a matter of minutes.

Mead Research to Install Beloit Experimental Unit

The first components of an experimental paper machine are on order for Mead Research Laboratories. The unit is to be housed in an extension of the pilot plant in Chillicothe, Ohio. The 52- by 153-ft. addition is now under construction.

Building the wet end for the laboratory machine is Beloit Iron Works. The later addition of a press section is planned. However, the new building will have to be enlarged if and when a dry end is installed.

The new structure will comprise two floors and rise 42 ft. from ground level. The machine will be installed on the upper level, with its auxiliary stock system below.

The fourdrinier section and headbox will measure 53 ft. long and will take a wire 42 in. by 95 ft. Width of the slice will be 36 in.

The headbox is to be adjustable, permitting studies of varying operating conditions. It will be possible to use either a pressure or vacuum head. Paper formed on the experimental unit will be carried from the couch roll to a pulper for repulping, passing again through the stock system. At maximum speed, that system will furnish the stock required for runs of up to 1 hr. in length. Either wet lap or dry pulp will be used.

Purpose of the project is to make fundamental studies in the papermaking process, including such problems as formation at high speed, effective headbox operation, drainage characteristics of fourdrinier components, etc.

Builds Warehouse, Bleach Plant

Mead is also building at Chillicothe a paper warehouse and a four-stage bleach plant, the latter with a capacity of 500 tons and providing a chlorine dioxide bleaching stage.

The main portion of the bleach plant will measure 70 by 72 ft. and will be surrounded by a larger ground floor. The tower is to be 80 ft. in height and flanked by four steel towers, two of which will also reach 80 ft. in height. The chlorination tower will be rubber-lined, the others tile-lined.

After bleaching the pulp will be stored in a high-density storage tank 36 ft. in diameter and 65 ft. high. It is to be of steel and tile-lined.

Graphic panels will give the operator easy control of the largely automatic process.

The new warehouse adds 120 ft. to the length of the storage building erected several years ago. The width of the unit now under construction is 240 ft. Two new truck docks—4 ft. deeper than the existing docks—will accommodate today's larger vehicles.

Mosinee Rebuilds Machine

Mosinee Paper Mills Co. is spending $500,000 at its Mosinee, Wis. mill to rebuild No. 2 paper machine.

Included in the project are the installation of Bauer cleaners, a new headbox and slice, a new motor-generator set, table roll deflectors, etc.

(Turn to page 1020)

Beans-and-flapjacks era disappears as . . .

FEEDING THE WOODS worker is a big, modern and efficient business. These views from a Canadian International camp show (top) a divisional butcher shop; (center) a typical camp kitchen, and (bottom) the end result: woods workers "digging in" after a strenuous day.

Modern Cookery Comes to the Man-in-the-Woods

BUSH CAMP cookery is a big, serious, scientific business—a far cry from the era when beans, pork and heavy bread were camp staples, and the chore boy frequently "doubled in brass" for the cook.

The magnitude of the task of feeding hordes of hungry woods workers can be best understood from simple facts and figures. In just one season recently Canadian loggers eagerly consumed: 9000 tons of meat, 3,900,000 lb. of fats, 24,000,000 eggs, 4750 tons of flour, 4,000,000 cases of canned goods, a pinch (3250 tons of sugar, 3,000,000 cases of canned milk and 700 tons of powdered milk.

Good food and plenty of it is an absolute necessity. For many Canadian pulp and paper mills and woodlands operators are quick to acknowledge that if the camp fare declines, a substantial part of the labor force will evaporate—will drift on to another camp where the food is better.

"The taste of bush workers has become more demanding during the past few years, and in fact they are now actually getting quite fussy." So says Lewis Brown, chief cook instructor for New Brunswick International Paper Co. (a subsidiary of Canadian International Paper Co.), and probably the dean of Canadian bush camp cooks.

Needed: 6000 Calories

N. B. International operates some 25 camp kitchens. Brown's task is two-fold. He supervises kitchen operation and is responsible for the training of new cooks.

Today's camp fare comprises a scientifically-compounded menu calling for an average of 90.37 oz. of food per man per day (including 17.3 oz. of meat) to yield the 6000-calorie diet required by the husky man-in-the-woods.

"Our boys are getting steak at least once a week, roast beef three times a week; and the breafast menu includes such items as juices, cereals, ham or bacon and eggs, hot biscuits and pancakes."

It was not so long ago that breakfast comprised beans and flapjacks or hot biscuits. At the end of the day, dinner presented salt pork, boiled cod or corned beef, potatoes and a vegetable.

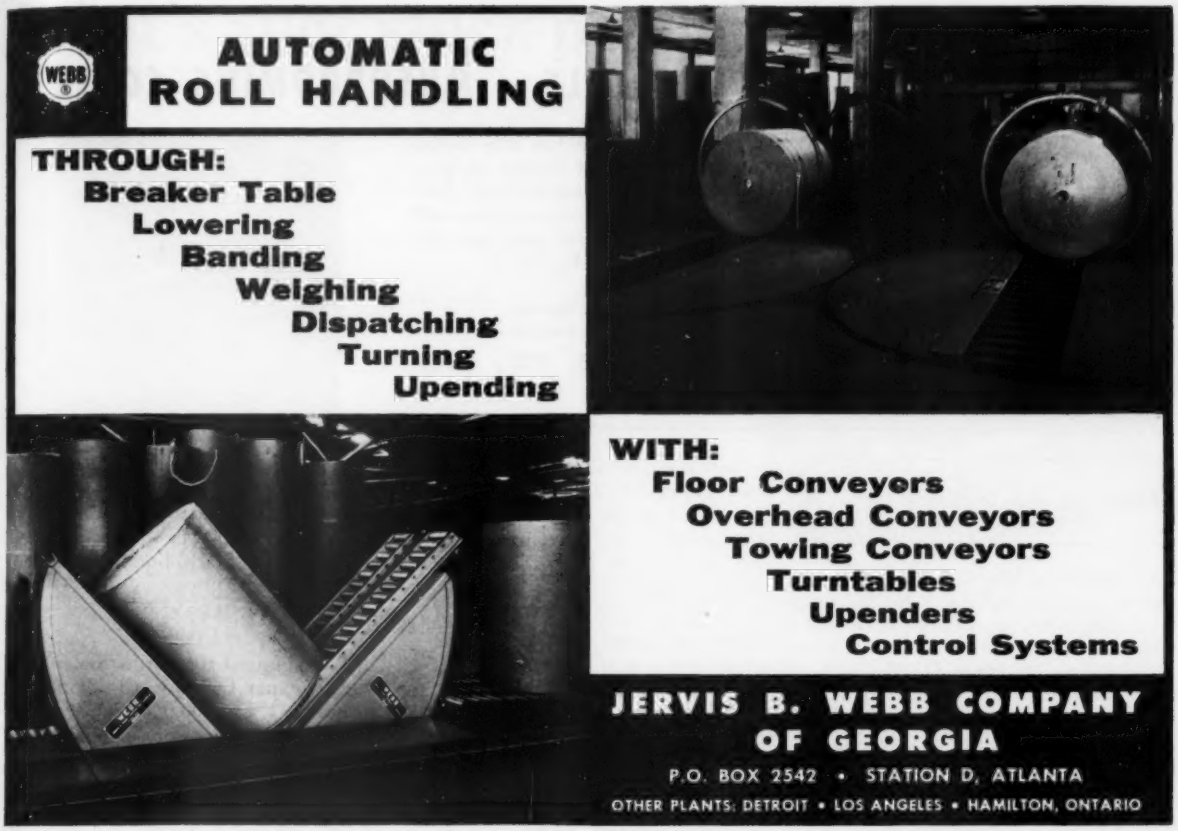
Cost and Quality

Brown calls awareness of costs and the proper usage of foodstuffs two of the chief problems encountered on his monthly visits to the 25 kitchens operated by N. B. International. In the high-calorie quality meals now being offered, wastage of even seemingly small quantities of food becomes an expensive proposition.

The average cost of the 6000-calorie diet should be in the vicinity of $1.20 to $1.25 per man per day for food alone. The trick? Mass purchasing and avoiding waste.

And with the revolution in the bush camp kitchen have come other substantial changes: vastly improved plumbing, lighting and messing facilities and the extensive use of plastic dishes to replace easily-chipped and easily-cracked agate ware. Cake and cookie "mixes" brighten the table and at the same time ease the cook's work burden. And currently a bread mix is in the development stage.

The era of modernization has further reached the cook himself. Today, prospective cooks generally ap-



prentice as "cookees" or helpers in camp kitchens for periods of from four to six years. Only then do they become full-fledged kitchen bosses.

Feeding an Army

Instruction includes not only the art of cooking but also a thorough training in keeping the camp dining room neat and presentable.

Pulp and paper firms and woodlands operators attach great importance to kitchen efficiency. Witness the fact that a bush camp cooking school is held annually at Fredericton, N. B. In attendance are camp cooks from throughout eastern Canada and northeastern United States.

Lew Brown presides over the instruction. For a week he brings fellow cooks up to date on the latest methods and techniques helpful in feeding the vast army of woodland workers, which in Canada alone numbers some 100,000 men.

Hardboard from Hardwood: Engineering Under Way for New Bowater Mill

Engineering is under way on the design of a hardboard mill that will be constructed at Catawba, S. C., by Bowater Board Co. The firm, a division of Bowaters Southern Paper Corp., will produce a daily 500,000 sq. ft. on a $\frac{1}{8}$-in. thick basis.

Bowater Board will be manufactured solely from hardwood in a new process developed as a result of research at a leased pilot plant in Coos Bay, Ore. This will be the first time that hardboard has been produced exclusively from hardwood.

The construction schedule will be coordinated with that of a pulp mill now being erected at Catawba by Bowaters Carolina Corp.

Although initial production will be on a base thickness of $\frac{1}{8}$ in., the equipment is being designed to produce thicknesses varying from 1/10 to $\frac{3}{8}$ in.

Permanent Paper Exhibit Opens at Philadelphia

The cutting of an 8-in. strip of paper recently marked the official opening of a permanent paper industry exhibit at the Franklin Institute in Philadelphia. The paper was produced on a miniature fourdrinier that is part of the display, sponsored by 18 Middle Atlantic area pulp and paper mills.

Highlight of the exhibit, which occupies nearly 2000 sq. ft. of floor area, is the 17-ft. scale model paper machine. Complete in every detail, the miniature produces an 8-in. web at a rate of 5 fpm. The 4000-lb. unit is 48 in. wide and was designed and produced by Rice Barton Corp.

Other exhibit features include a 128-ft. photomural and an illuminated flow chart dramatically illustrating the entire pulp and paper manufacturing process from tree to finished product. Other panels are devoted to an explanation of the basic papermaking processes, quality control testing methods and a display of various end products.

$400,000 Efficiency Program Outlined by Allied Paper Corp.

Allied Paper Corp., with headquarters in Chicago, has announced a $400,000 program designed to increase the efficiency of its paper machines.

Each of the firm's nine units will be equipped with Sveen-Pederson savealls of the flotation type, the flotation process causing the fibers, fillers and similar materials to be electrically neutralized with a cationic additive.

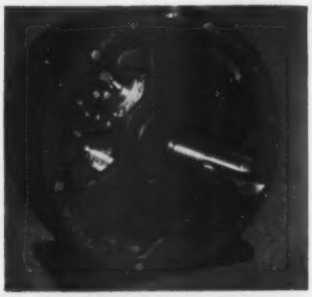
The entire program is scheduled

STOP TELESCOPING ROLLS • MUSHROOMING CORES

Use HORTON Clutches and Brakes to control the sheet tension on your center winders and back stands. Take the guess work out of tensioning and let Horton equipment give you uniform good rolls all the time.

VARIABLE SPEED CLUTCH PULLEYS
GOVERNOR CONTROLLED BRAKES

HORTON MFG. CO., INC.
MINNEAPOLIS 14, MINNESOTA



News of the Industry . . .

for completion July 1. However, the first three units will be in operation by April 1 at the Bryant Mills in Kalamazoo, Mich.

According to James H. McClure, vice president for manufacturing, the new equipment will enable the firm to turn out higher quality printing papers, cut down on manufacturing wastes and at the same time greatly reduce the problem of stream pollution.

Proposed Merger of West Coast Mills Announced

The proposed merger of Puget Sound Pulp & Timber Co. and Pacific Coast Paper Mills of Washington Inc. was announced recently.

Conditions of the action have been unanimously approved by the full boards of directors of both firms, each of which is located at Bellingham, Wash.

Under the merger plan as announced, Pacific Coast Paper Mills would operate as a division of Puget Sound Pulp & Timber.

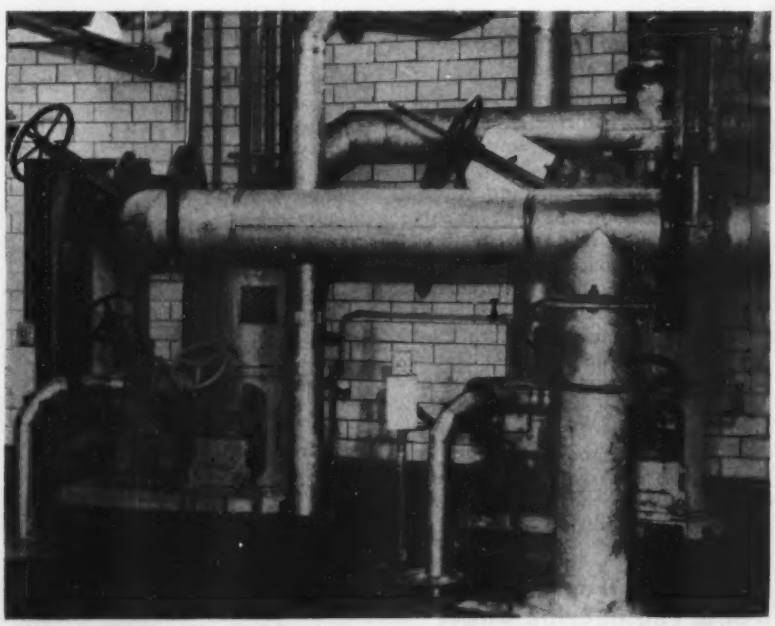
Recent Expansions in the Industry

Crossett Paper Mills
of Crossett, Ark., will spend $200,000 this year to enlarge its research laboratory. In a 60-per cent expansion, some 5500 sq. ft. of floor space will be added to existing facilities. Included will be cold storage and constant humidity rooms and a pilot plant to test new types of bleached foodboard and treated paper.

Allied Paper Corp.
of Chicago has exercised its option to purchase the Sharon Div. of Osborn Paper Co. Inc. of Sunnyvale, Cal. The Chicago firm now has tablet, stationery and envelope production facilities in both the Midwest and Far West.

Fibreboard Paper Products Corp.
is installing dust- and odor-control equipment at a cost of $608,000 at its San Joaquin pulp and board mill in Antioch, Cal. According to T. M. Lindley, plant manager, the project —scheduled for completion in the spring—will incorporate the most up-to-date control devices designed for any North American pulp mill. Included will be the renovation of two existing precipitators, the installation of a flue gas washer (140,000 cfm), an 80-ft. gas incinerating furnace, a 10,000-cu. ft. gas holder and a 40-ft. black liquor oxidizing tower.

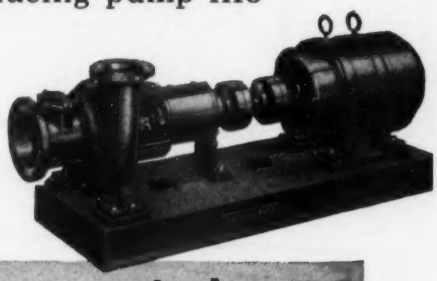
W. R. Grace & Co.
has announced the formation of the Grace Paper Co. Div. to administer the firm's $50,000,000 paper manufacturing expansion program in Latin America. Headed by Wentworth Brown as president, the new division will function as part of the Latin American Paper & Chemical Group. The expansion is an outgrowth of the Peruvian bagasse pa-



FINCH, PRUYN & CO. of Glens Falls, N. Y., has put two Black-Clawson Co. Selectifier screens to a new use. In the paper manufacturer's new bleached hardwood neutral sulfite pulp mill the units are removing coarse dirt, shives and knots from brown stock as it is pumped from refiners to vacuum washers. According to B-C, "the 24P Selectifier has proved highly effective in preparing Finch, Pruyn's hardwood pulp for bleaching and blending into the company's line of high-strength, high-brightness groundwood printing and converting papers".

What's your stock pumping problem?

- ☐ Clogging due to high consistencies
- ☐ Vapor-binding due to entrained air
- ☐ Losing prime
- ☐ Corrosion or abrasion reducing pump life



Here's the answer:

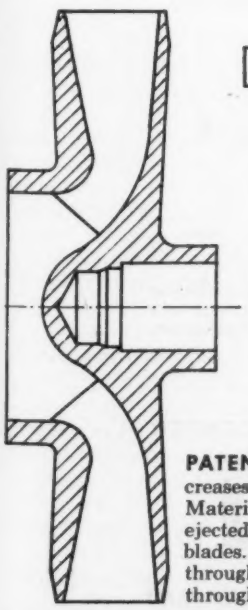
The IR Ingersoll-Rand All-Purpose stock pump

☐ **CLOGGING?** With its patented *diverging* impeller (see illustration), the I-R All-Purpose pump efficiently handles stock at consistencies as high as 10 percent! This means increased stock chest capacities, reduced bleaching costs, savings in mill water.

☐ **VAPOR BINDING?** Foamy solutions containing large amounts of entrained air or gas can be pumped continuously... with the exclusive diverging impeller.

☐ **LOSING PRIME?** Treated, sized or foamy stock can be pumped without air binding or losing prime as long as flow is maintained to the pump. Stock chests can be completely emptied and the suction piping exposed to air without losing prime.

☐ **CORROSION or ABRASION?** Lower internal velocities with gradual changes in cross-sectional area results in longer service life when pumping abrasive or corrosive liquids. Available in a wide variety of materials for most liquids.



PATENTED DIVERGING IMPELLER increases in width from center to periphery. Material cannot enter fast enough to replace ejected material, and vacuum forms between blades. Entrained air can't bind as it passes through the vacuum. Solids and slurries go through without abrupt acceleration.

As an added feature on the Ingersoll-Rand All-Purpose stock pump, the patented diverging impeller is *interchangeable* with the conventional type impeller. You can switch this pump from normal to heaviest stock service *simply by switching impellers and casing rings.* Ask your local I-R representative for full details on the All-Purpose stock pump; there's nothing like it on the market!

Ingersoll-Rand

10-633 11 Broadway, New York 4, N.Y.

PUMPS • COMPRESSORS • DIESEL ENGINES • AIR & ELECTRIC TOOLS • TURBO BLOWERS • CONDENSERS

Good tip! Maybe you don't specialize in ticker tape, but if you make *any* papers for profit, put your money on Clinton starches. For internal and surface sizing, and for coating, Clinton is a sure bet. Clinton's enzyme converting starches PM-3011 and PM-3021, for example, give consistently uniform coating because they convert well at high solids levels. The unvarying high quality of all Clinton products gives you closer quality control over *your* products.

To aid papermakers, and to develop new corn refining processes and products, Clinton is now at work in a new million-dollar research center. This modern laboratory serves as "home-base" for your Clinton technical man.

. . . *and remember* technical service in connection with your specific problems is available without obligation.

Quality products

FROM THE WORLD'S CORN CENTER

CLINTON

CLINTON CORN PROCESSING COMPANY

CLINTON, IOWA

per operation pioneered by Grace more than 15 years ago and includes new papermaking and converting operations in Brazil, Colombia, Puerto Rico, Mexico and Cuba.

Stone Containers Corp.'s
Western Paper Box Div. has purchased one unit of the Studebaker-Packard plant in Detroit. The 150,000-sq. ft. unit was acquired from a New York-Miami group. According to spokesmen for Western Paper Box, "This acquisition will enable greatly expanded service to Detroit area users of folding and set-up boxes and corrugated containers".

North Western Pulp & Power Ltd.'s
new pulp mill at Hinton, Alta., is currently approaching its planned daily capacity of 430 tons. According to a spokesman for St. Regis Paper Co., "It is now evident that a larger production will eventually be achieved". (The bleached sulfate pulp plant is jointly owned by St. Regis and North Canadian Oils Ltd.)

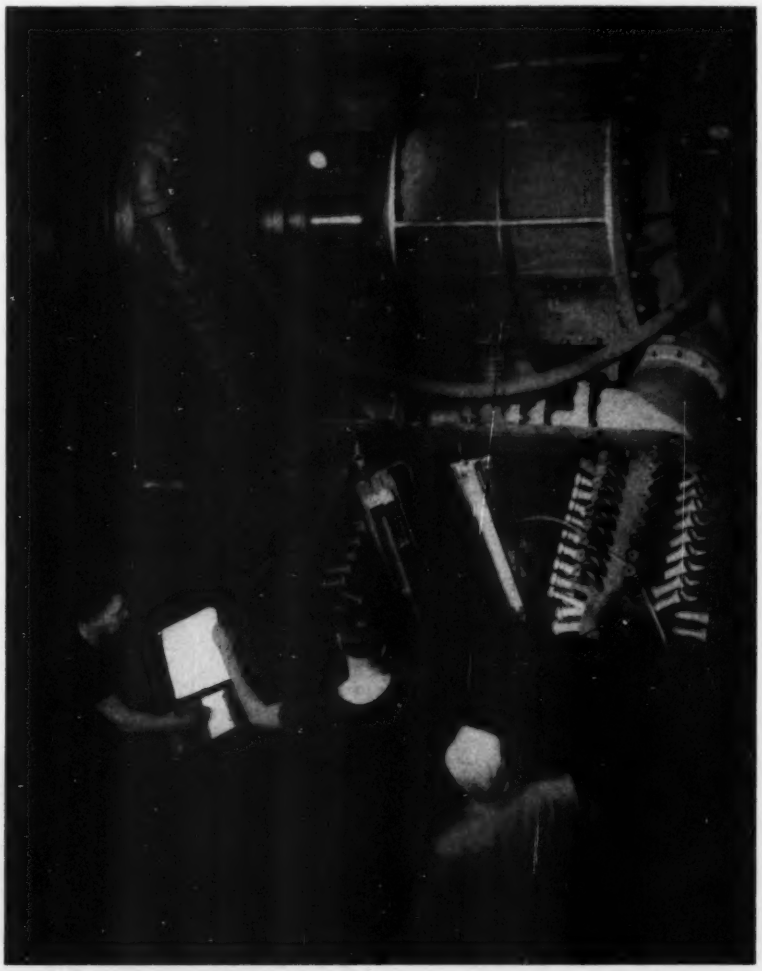
British Columbia Forest Products Ltd.'s
recently completed $46,000,000 sulfate pulp mill at Crofton, B. C., produced its first test pulp late in December. The tune-up period is continuing, and the "checking out of equipment is progressing well". (See THE PAPER INDUSTRY, July 1957.)

Dobeckmum Co.,
a division of Dow Chemical Co., will make capital expenditures in excess of $500,000 at its Berkeley, Cal. branch. Additions will include warehouse space; the installation of six-color flexographic presses, and additional color decks for existing presses. Complete laboratory testing facilities have been installed for product analysis.

Paramount Packaging Corp.
of Philadelphia has acquired Container Corp. of America's Flexible Packaging Div. in Chicago. Included in the transaction are the buildings and equipment of the former Traver Corp., which was purchased by Container Corp. in 1954.

Champion Paper & Fibre Co.
of Hamilton, Ohio, has acquired an interest in a new firm that is erect-

Rated performance of every Nash Vacuum Pump is assured by this precise laboratory test



Rated capacities of Nash Vacuum Pumps are not theoretical. Every Nash Pump is tested individually. Air capacity is determined by delivery thru accurately machined and calibrated orifices. Related vacuum is measured by precise mercury column, and horse power is recorded electro-dynamically. Records of these tests are retained by us, and certified copies are available to Nash Pump owners.

That is one of the reasons why Nash Vacuum Pumps are installed in over a thousand leading Paper Mills. An engineer from Nash will be glad to survey your mill, and make recommendations, entirely without obligation to you.

NASH ENGINEERING COMPANY
440 WILSON ROAD, SO. NORWALK, CONN.

ENGLISH ECCO CLAYS CLAYS

TRADE MARK

UNIFORM • SUPERIOR • DEPENDABLE

English China Clays Sales Corporation
6 East 45th Street, New York 17, N.Y.

News of the Industry . .

ing Brazil's first completely integrated bleached kraft pulping plant. The Ohio firm will be responsible for management and operation of the 150-ton plant that will use eucalyptus as its raw material. Operation is expected early in 1959. Stadler, Hurter & Co., Canadian consulting engineering firm, designed the facility.

West Virginia Pulp & Paper Co.,
in conjunction with Cluett, Peabody & Co. Inc., has announced the formation of Clupak Inc., which has been created to license paper manufacturers to use Westvaco's stretchable paper process. In addition to licensing paper manufacturers, Clupak will conduct extensive investigation and further development in the paper field and will furnish technical assistance to licensees.

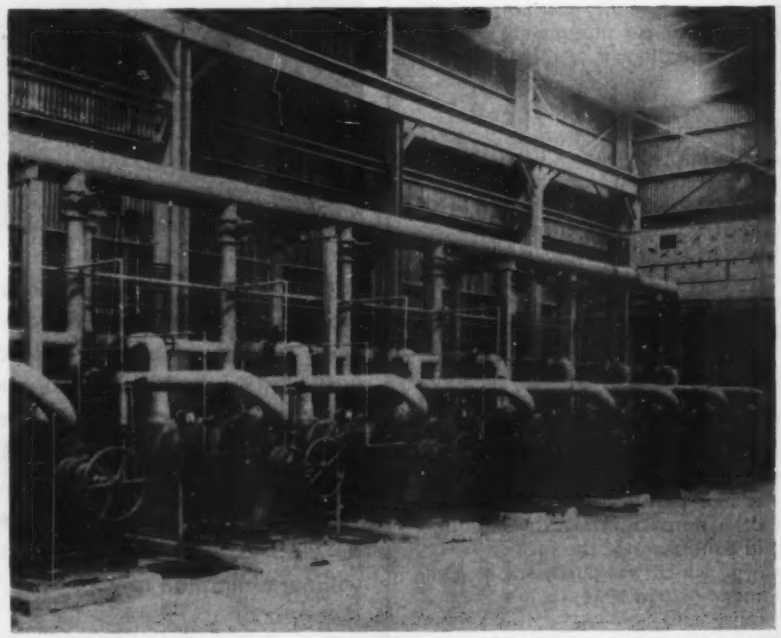
Narrow Fabric Co.'s
Wyomissing Paper Products Div. has recently installed a 66-in. Warren-Dilts (Black-Clawson Co.) air doctor coater at its Reading, Pa. plant. In operation on a wide range of sulfite grades (handling both white and pigmented colors), the unit is of open design with all controls easily accessible.

St. Joe Paper Co.
of Port St. Joe, Fla., which recently purchased Reynolds Bros. Lumber Co. of Albany, Ga., has "temporarily shelved" plans to build a $500,000 sawmill in the Albany area. St. Joe Paper reported that it will wait for improved building conditions, adding that—since much of the several thousand acres of saw timber included in the Reynolds purchase has reached maximum growth—the mill will probably be erected in the not-too-distant future.

American Can Co.
has formed a Dixie Cup Div. that will handle the operations of the former Dixie Cup Co.—merged into Canco in 1957. Appointed vice president and general manager of the new division was C. L. Van Schaick, formerly president of Dixie Cup. Dixie's general offices remain at Easton, Pa.

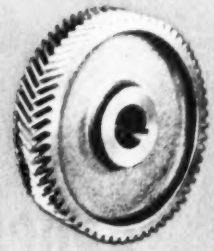
Scott Paper Co.'s
Hollingsworth & Whitney Div. plant in Mobile, Ala., has installed corrosion-resistant wrought iron pipe in condensate service. The more than 40 tons of piping in sizes from 2½ to 10 in. for aggressive condensate and steam process applications was furnished by A. M. Byers Co. of Pittsburgh. Engineering was by Charles T. Main Inc. of Boston.

Great Lakes Paper Co. Ltd.
has installed at Fort William, Ont., "the largest shower pipe installation of its kind in North America". Engineered and manufactured by Pulp & Paper Mill Accessories Ltd. (Canadian licensee for the Emerson Mfg. Co. Div. of John W. Bolton & Sons Inc.), the shower pipes are 6 in. in diameter and 412 in. long.

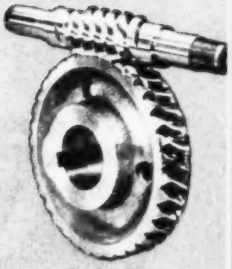


STOCK PREPARATION UNITS recently installed at the new Eden mill of Whippany Paper Board Co. Inc. in Whippany, N. J. The 24 Emerson jordans (John W. Bolton & Sons Inc.) supply the new 234-in. eight-cylinder board machine and the 250-in. fourdrinier that was set to enter production shortly after the first of the year.

67 of the 100



...largest U.S. industrial corporations* are customers of ILLINOIS GEAR



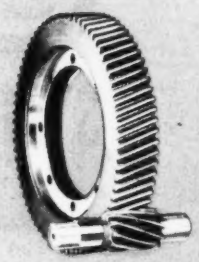
In some fields this percentage is even higher. Of the major metal producing companies* 77% are customers of ILLINOIS GEAR.

These are very remarkable percentages indeed . . . yet they reflect the preference for ILLINOIS GEARS by gear users, large and small, throughout industry.

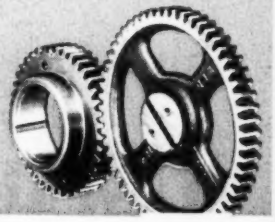
And there's good reason: gear users turn to ILLINOIS GEAR because they are placing an ever-increasing emphasis on quality in gears . . . a quality that they demand and get in every order.

No matter what the industry . . . machine tools, steel mills, cement mills, paper mills, chemical plants, construction equipment . . . this recognition for quality in gears has been rightfully earned because it characterizes every step in the manufacture of ILLINOIS GEARS.

If you want gears that are made right, with quality as the first consideration, specify and buy ILLINOIS GEARS...they will more than satisfy your most exacting requirements.



*From The Fortune Directory of the 500 Largest U.S. Industrial Corporations, July 1957.



Look for this mark ILLG® *the symbol on finer gears*

ILLINOIS GEARS
Reg U.S. Pat Off

Gears for Every Purpose ... one gear or 10,000 or more

ILLINOIS GEAR & MACHINE COMPANY

2108 North Natchez Avenue • Chicago 35, Illinois

TO HELP YOU PROCESS MORE PROFIT FROM PAPER

OK BRAND

STARCHES

OK Keogel—An effective cold water swelling beater additive. Simple to use ... no cooking... just add to beaters. Requires no involved equipment or cooking procedures. Disperses readily ... causes no "Fisheyes." High resistance to breakdown ... for better starch retention and higher strength tests and fiber bonding.

OK Keofilms—Complete range of controlled viscosity thin boiling starches ... adaptable to many surface sizing problems.

OK Keozyme—High purity, consistent, carefully processed corn starch for enzyme conversion. Exacting quality control to insure low residue and optimum conditions for proper enzyme action. For surface sizing or pigment coating binder this starch offers highest quality available.

OK Keoclors—A new line of oxidized starches ... for coating adhesive and surface sizing application. Surface sizing at press or calender will benefit from controlled and stable viscosity, good penetration and color. Adhesive strength and colloidal characteristics offer improved bonding and operation for medium and low solids pigments coating.

OK Keocote—Enzyme converting corn starch with lower than normal peak viscosity. Particularly adaptable to operations requiring conversions at high starch solids or in presence of pigments. Low initial viscosity permits more rapid heat transfer and even conversion.

OK Special—Starches will be formulated for your needs... phone or write for a Hubinger paper starch representative who will be glad to help you solve any starch related problem.

the complete paper mill line...

The Hubinger Company

HUBINGER — QUALITY PRODUCTS — 77 YEARS — From CORN

KEOKUK, IOWA

New York • Chicago • Los Angeles • Boston • Charlotte • Philadelphia

News of the Industry . . .

They are in use on Great Lakes Paper's No. 4 newsprint machine and cover the entire 342 in. of sprayed surface. (No. 4 is said to be the world's largest paper machine.)

Riegel Paper Corp.
has announced that new coating facilities now make it possible for the application of solvent and aqueous coatings to paperboard stock of up to 25-pt. thickness. Such coatings were previously available only on lighter weight papers.

Mead Corp.
of Dayton, Ohio, has agreed to purchase through an exchange of stock Bermingham & Prosser Co., Chicago distributor of writing, printing and industrial papers. B&P will operate as a wholly-owned Mead subsidiary. The Chicago company has offices and warehouses in St. Louis, Kansas City, Wichita, Des Moines, Kalamazoo and Akron.

Allied Container Corp.
of Boston is nearing completion of its 200,000-sq. ft. corrugated box plant at Dedham, Mass. In the multimillion-dollar facility will be installed "the largest corrugator in New England"—a unit capable of producing 96-in. corrugated board at speeds of up to 750 fpm.

Abitibi Power & Paper Co. Ltd.
has signed a $7,735,000 contract with Twin Cities Gas Co. providing for the delivery of a total of 20.8 billion cu. ft. of natural gas over a 10-year period. This is the first major sale of natural gas to industry in northern Ontario and represents a major portion of Abitibi's fuel requirements for its three mills at Port Arthur and Fort William.

Compania De Celulosa de Filipinas
will install a 30-ton (metric) Pusey & Jones Corp. paper machine at its Manila, P. I. mill. Operation of the 92-in. unit—one of the few constructed for use with bagasse fiber pulp—is expected in June. Producing bond, book, writing and wrapping papers, the machine will have a maximum speed of 600 fpm.

Forestry Notes . . .

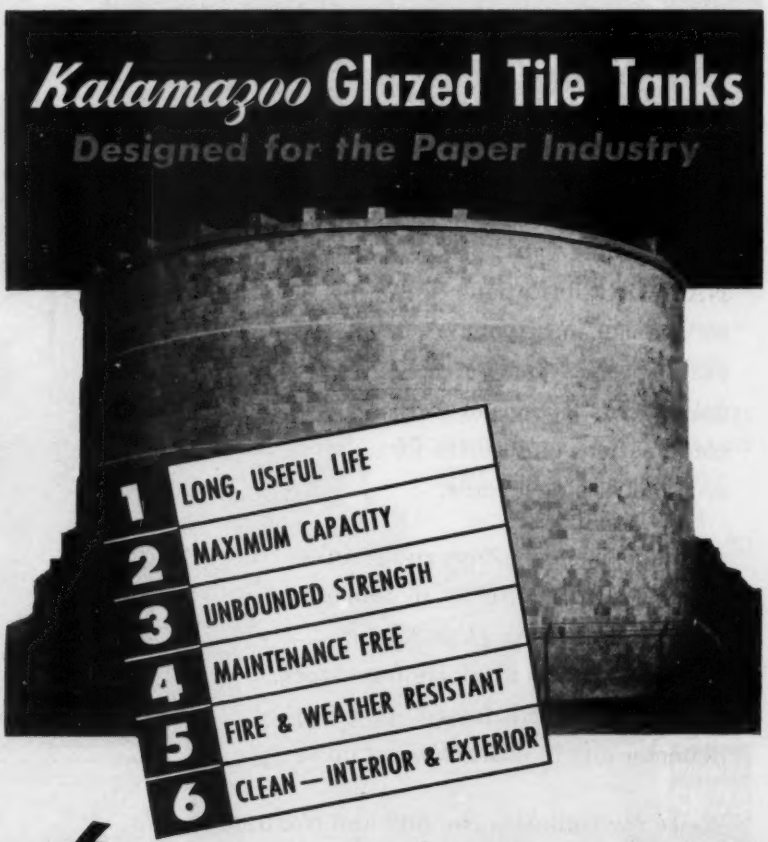
One Billion New Trees; Brown Co. Uses "Everything but the Shade"

FOR THE FIRST TIME in history the United States will plant 1 billion forest trees during 1958. This according to Ezra Taft Benson, secretary of agriculture, who added that the billionth seedling will be planted December 18 at Macon, Ga.

The 1958 record exceeds by about 200,000,000 trees the previous high set in 1956. The total includes all forest, soil bank conservation reserve and windbarrier trees planted by private landowners, industries and public agencies.

The greatest progress in planting is occurring on private lands, where in 1957 about 86 per cent of all planting took place. Only 14 per cent was on public lands. Twenty years ago: private lands, 26 per cent, and public lands, 74 per cent.

While encouraged by the 1958



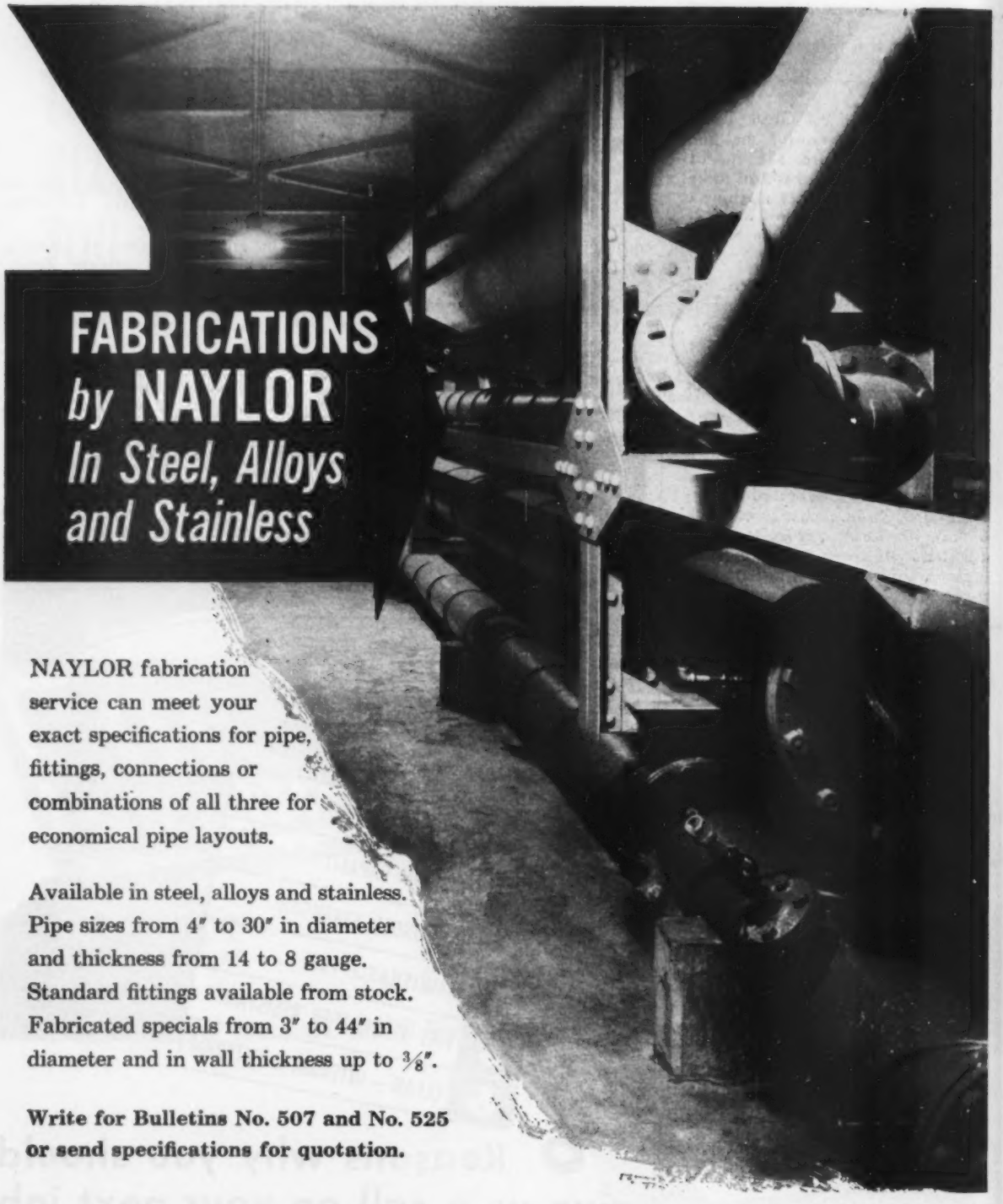
6 Reasons why you should give us a call on your next job

Kalamazoo's steel reinforced glazed tile tanks are designed and erected by experts. If you have a specialized building problem it will pay you early dividends to call us now.

KALAMAZOO TANK & SILO CO. 90 YRS. 1867 • 1957

TILE TANK DIVISION

Kalamazoo TANK & SILO CO. KALAMAZOO MICHIGAN



FABRICATIONS *by* NAYLOR *In Steel, Alloys and Stainless*

NAYLOR fabrication service can meet your exact specifications for pipe, fittings, connections or combinations of all three for economical pipe layouts.

Available in steel, alloys and stainless. Pipe sizes from 4″ to 30″ in diameter and thickness from 14 to 8 gauge. Standard fittings available from stock. Fabricated specials from 3″ to 44″ in diameter and in wall thickness up to ⅜″.

Write for Bulletins No. 507 and No. 525 or send specifications for quotation.

NAYLOR

NAYLOR PIPE COMPANY

1233 East 92nd Street, Chicago 19, Illinois

Eastern U.S. and Foreign Sales Office 60 East 42nd Street, New York 17, N. Y.

record, Secretary Benson declared that even at the rate of 1 billion trees a year it will require more than 50 years to restore to tree growth land that must be planted to make it productive again.

The greatest part of the 1958 planting will be on private lands, since 75 per cent of all commercial forest area in the United States is in private ownership.

"Everything but the Shade"

Utilization for commercial purposes of "everything but the shade" from trees cut in New England forests came a step closer to fact recently when Brown Co. reported the first shipments of specially-processed bark to be sold as a material for growing orchids.

The processing of yellow birch bark for this purpose is part of the Berlin, N.H. firm's program to use to the fullest extent bark from thousands of trees cut each year in Maine, New Hampshire and Vermont.

Experiments have also shown that bark from northern New England trees is an excellent supplement to peat moss as a soil mulch, a top dressing for lawns and as an organic material to be mixed with soil in the growing of plants and shrubs.

A spokesman for the company reported that, "Orchids grown in fresh hardwood bark have better flowers, grow quicker and are much cheaper to repot".

Research into the horticultural and other possible commercial uses of bark has been going on for more than a decade. Early experiments were carried out in the 1940s in Brown Co. gardens. In 1950 the firm made a grant to the University of New Hampshire for research in the use of bark. And research projects are continuing at the school, as well as at various eastern experimental stations.

Allied News Notes . . .

Monsanto Chemical Co. has inaugurated rapid delivery of Mersize fortified rosin size by tank truck to paper mills in the Springfield, Mass. area. This is the fifth paper-producing area to be offered such service, the others being Addyston, Ohio; Appleton, Wis.; Kalamazoo, Mich., and Seattle.

New Jersey Zinc Co. has announced that the Bulkley Dunton Organization of New York, N.Y., will distribute Horse Head titanium dioxides to the paper industry throughout most of the United States. The line comprises a complete range of both anatase and rutile dioxides produced at New Jersey Zinc's plant at Gloucester City, N.J.

Coming Events

Tappi

March 27—Delaware Valley Section, Engineers Club, Philadelphia

Superintendents Association

March 18—Miami Valley Division, Manchester Hotel, Middletown, Ohio

April 22—Miami Valley Division, Manchester Hotel, Middletown, Ohio

Other meetings

March 27-28—American Institute of Electrical Engineers, Annual Pulp & Paper Industry Electrical Engineering Conference, North Carolina State College, Raleigh, N. C.

April 9-11—Fifth Annual Conference on Accident Prevention Engineering, University of Florida, Gainesville, Fla.

April 21-23—Fibre Box Association (annual spring meeting), Edgewater Beach Hotel, Chicago

The Trade-Mark of
DEPENDABLE
FELTS
The
WATERBURY Felt Company
SKANEATELES FALLS, N. Y.

Nine Publications for Papermakers

Pulp and Paper, Volume 1 (Casey)	$18.00
Pulp and Paper, Volume II (Casey)	18.00
Paper and Paperboard Making (Williamson)	6.00
Technology of Paper Coating	2.00
Lessons in Papermaking—Part 1	1.50
Lessons in Papermaking—Part 2	1.50
Notes and Observation on Beaters	1.00
Trouble on the Paper Machine	.75
Technology of Papermaking Fibres	.50

Mail your order with payment to:

The PAPER INDUSTRY

431 S. Dearborn Street, Chicago 5, Illinois

HANCHETT **CIRCULAR KNIFE GRINDER**
For TOP and BOTTOM SLITTER KNIVES
SCORING KNIVES and SEGMENTS
SEMI and FULL Automatic

GUARANTEE:
1. Concentric with Bore and Running Truth .0005
2. Micro Inch Finishes
3. Grinds Single, Double and Compound Bevels
4. Positive — Accurate Fixturing
5. Longer Mill Life (Less Changes)

MODEL SK-24 WET GRIND

TEST GRIND
We are prepared to grind knives for your inspection and Mill Test.

HANCHETT MANUFACTURING CO.
Main Office BIG RAPIDS, MICHIGAN
West Coast PORTLAND 1, OREGON

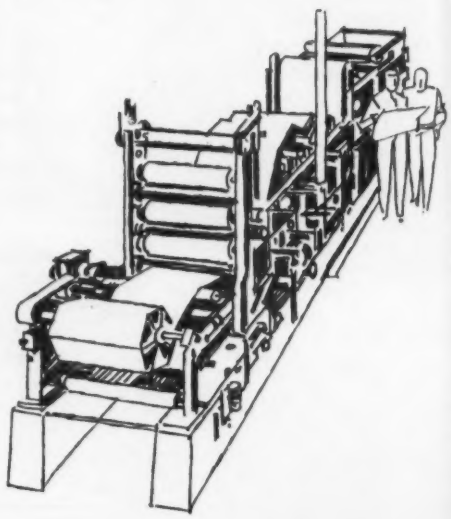
Quality...from start to finish!

Versatile ACIPCO Centrifugally Spun Tubes

Carbon Steel...Alloy Steel...Stainless Steel
Special Corrosion Resisting Alloys

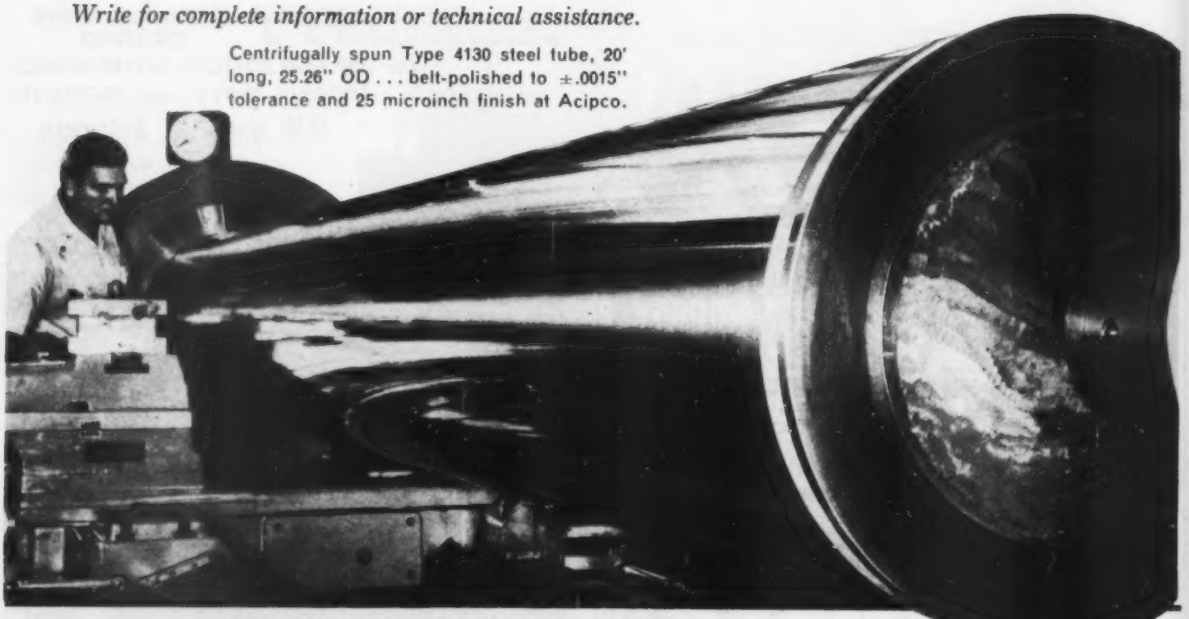
Look at that surface! It is only one of the advantages you get in the non-directional grain structure of Acipco centrifugally spun steel tubes. As a result of Acipco's centrifugal process, you also get *inherent* dimensional stability and dynamic balance.

Now produced in the longer lengths required by modern equipment, Acipco steel tubes are used in the manufacture of calender, engraving, press, slitter, rewinder, plate cylinder, squeeze and starch bath rolls, and in hundreds of other industrial applications.



Write for complete information or technical assistance.

Centrifugally spun Type 4130 steel tube, 20' long, 25.26" OD . . . belt-polished to ±.0015" tolerance and 25 microinch finish at Acipco.



SPECIAL PRODUCTS DIVISION
AMERICAN
CAST IRON PIPE CO.
BIRMINGHAM 2, ALABAMA

NAMES in the NEWS

Allied Advances Larson

Allied Paper Corp. has announced the promotion of Robert Larson to head the firm's process control department. He was formerly technical superintendent at the King Div. in Kalamazoo, Mich.

Larson joined Allied in October 1957, having previously been superintendent of the Anniston, Ala. plant of National Gypsum Co.

In another Allied announcement, Charles Litten has retired as tour superintendent of the Monarch book mill in Kalamazoo. He joined Bardeen Paper Co. at Otsego, Mich., in 1913 at the age of 16 and since that time has been associated with the Bardeen, King and Monarch divisions of Allied.

R. A. Larson

L. V. Forman

Forman, Dickey Promoted by Scott on West Coast

Loren V. Forman has been named general manager of all West Coast manufacturing and timber operations of Scott Paper Co. Since 1956 he had been general manager of the Everett, Wash. plant.

Forman joined the Scott staff in 1950 at Chester, Pa., and was named staff technical director at Everett in 1953. He held that post until being named general manager in 1956.

A graduate of the Institute of Paper Chemistry in Appleton, Wis., and at one time a member of the Institute staff, Forman succeeds Charles D. Dickey Jr., who has been elected president of British Columbia Forest Products Ltd.

Dickey fills the vacancy caused by the recent death of Hector G. Munro. He has been a member of the board of directors of British Columbia Forest Products since 1955 and prior to his election was assistant vice president of Scott Paper in charge of all West Coast operations.

D. G. Griffee

E. M. Whitcomb Jr.

Eastern Corp. Promotes Griffee and Whitcomb

Eastern Corp. of Bangor, Maine, has announced several promotions to newly created positions:

Donald G. Griffee, superintendent of the South Brewer pulp mill, has been named resident manager of the firm's extensive pulp and paper manufacturing facilities at Lincoln. This includes the bleached sulfate plant that is to be in operation this spring. Griffee joined Eastern's engineering staff in 1946.

Eben E. Whitcomb Jr., formerly assistant paper mill superintendent at Lincoln, becomes technical service engineer responsible for coordinating the activities of the South Brewer and Lincoln mills with customer requirements in the field.

Emerson Lewis, pulp mill superintendent at Lincoln, has been named manager of materials handling. He will be responsible for all warehouse, shipping, inter-mill trucking and other service operations for the Maine mills.

Paul I. Coughlin, assistant superintendent of the papermaking department at South Brewer, becomes quality control superintendent for both plants.

Allied Personalities . . .

Wayne Davis, vice president for felt sales of Albany Felt Co., recently celebrated his 40th anniversary with the firm. He joined the company in 1918 as a sales correspondent.

Ed Crowley has rejoined Carthage Machine Co. and is headquartered at Atlanta. A chemical engineer, he has had many years' experience with the pulp and paper industry.

Albert M. Thomas has been named administrative vice president of Pusey & Jones Corp. of Wilmington, Del., and **Martin W. Schultz** at the same time was made vice president in charge of manufacturing. Thomas was previously vice president and sales manager for Heller Tool Co., while Schultz was formerly associated with General Motors Co. At the same time, **John W. Kolybaba,** at one time with Black-Clawson Co., was appointed Pusey & Jones' general sales manager in the Paper Machinery Div.

Tany Agronin, for many years associated with Black-Clawson Co. and most recently with its Brazilian affiliate, has been named executive vice president and general manager of Appleton Machine Co. At the same time, **Ray S. Bender** was appointed vice president of Appleton Machine to succeed **R. M. Radsch.** Bender was formerly manager of sales engineering. Radsch is retiring but remains as a consultant.

Frank G. Fisher, formerly vice president and general manager of Rheem Automotive Co., has been named president and general manager of the Atkins Saw Div. of Borg-Warner Corp.

Michael D. Mullin, assistant to the general sales manager, has been appointed director of bulk product sales for Corn Products Refining Co. to succeed the retiring **Edward W. Schmitt.** Replacing Mullin as assistant to the general sales manager is **Thomas A. Bruce,** formerly assistant bulk sales manager.

Carl Magnus has been elected vice president in charge of pulp and paper operations for Calkin & Bayley Inc. **John L. Parsons,** associated with the firm since its inception, becomes vice president in charge of

The lighter side of paper . . . when it's a matter of whiteness, brightness and opacity . . . is best provided by TITANOX* titanium dioxide white pigments: number one choice in white pigments among paper makers.

Regardless of paper product—from bible paper to building board; regardless of purpose—from brand identification in food wrappers to easy legibility in printing papers . . . there's a TITANOX pigment for best results: TITANOX-AWD, TITANOX-C-50, or TITANOX-RA-50. In addition, TITANOX pigments will lighten the burden of processing, through their ease of dispersion and uniformity of all properties. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; offices and warehouses in principal cities.

5722

TITANIUM PIGMENT CORPORATION

Subsidiary of **NATIONAL LEAD COMPANY**

*TITANOX is a registered trademark for the full line of titanium pigments offered by Titanium Pigment Corporation.

pulp and paper research and development.

Fred C. Jones will represent the Paper Machinery Div. of Pusey & Jones Corp. in the South and Southwest. Associated with the paper industry since 1923, he was formerly on the staff of Black-Clawson Co. and will make his headquarters in Atlanta.

Jack H. Reid, a sales representative for American Cyanamid Co., has become southern sales representative for the pulp and paper mill equipment division of Bauer Bros. Co. He will headquarter in Charlotte, N. C.

Necrology . . .

Cliff R. Crawford

C. R. Crawford

Cliff R. Crawford, vice chairman of the board of Black-Clawson Co., died unexpectedly January 31 in Hartsville, S. C., while on a business trip. He was 68.

Crawford began his career in 1909 with Shartle Bros. Machine Co. in Middletown, Ohio. At the time of Shartle's merger with Black-Clawson in 1926 he was chief engineer. He subsequently served as vice president and general manager of the Shartle Div. and in 1951 was elected president of the parent firm. Crawford resigned in September of last year and was elected vice chairman of the board.

During his presidency, Black-Clawson acquired both Bagley & Sewall Co. and Pandia Inc. and greatly extended the scope of its business activity abroad.

Edwin A. Meyer

Edwin A. Meyer, board chairman of Badger Paper Mills Inc. of Peshtigo, Wis., died at his Menominee, Mich. home in February. He was 66.

He became associated with the industry as an office boy for Kimberly-Clark Corp. at Neenah, Wis., in 1909. He joined Menasha Printing & Carton Co. in 1917. That firm later became Marathon Corp., of which he was vice president and general manager until 1929, when he founded Badger Paper Mills.

F. H. Williams

Frank H. Williams, 58, general superintendent for Crane & Co. Inc. at Dalton, Mass., died recently following a short illness.

A native of New England, Williams joined Crane at the Bay State Mill in 1916 as a larborer in the rag room. Following assignments in nearly every mill department, he was named superintendent and in 1945 became general superintendent.

Carlos E. Bronson

Carlos E. Bronson, former vice president and chief engineer of the Kewanee Boiler Div. of American Radiator & Standard Sanitary Corp., died in January at his Kewanee, Ill. home. He was 71.

Bronson had been associated with the division for 42 years prior to his retirement in 1956.

Charles L. Bauer

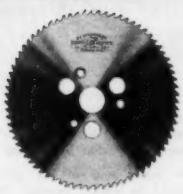
Charles L. Bauer, former president and general manager of Bauer Bros. Co. of Springfield, Ohio, died in January at the age of 86. He had been in failing health several years.

Bauer in 1904 purchased with his brothers the former Foos Mfg. Co., and he was named president at that time. The name of the firm was changed in 1910 to Bauer Bros. Co. Bauer was made general manager as well as president in 1924 and held both positions until his retirement in 1946.

Frank X. Gilg, 57, an executive assistant in the boiler division of Babcock & Wilcox Co., died unexpectedly in January at his Bronxville, N. Y. home. He joined the firm in 1922 as a draftsman at the former Bayonne, N. J. plant, became a staff engineer in 1945, an application engineer in 1948 and was appointed executive assistant in the boiler division in 1953.

Elmer C. Carling, 48, sales manager in the Pigments Div. of American Cyanamid Co., died in January after a short illness. In 1947 Carling established an eastern regional sales office in New York, N. Y., for the American Cyanamid pigments department, then a part of the Organic Chemicals Div. He became assistant sales manager for the department in 1949 and was named sales manager of the newly formed Pigments Div. in 1954.

KEENER EDGE...CLEANER CUT...
LONGER LIFE PER KNIFE...
WITH ATKINS Silver Steel®



CIRCULAR ELECTROTYPE SAWS
Try this saw in your shop. Note the ease and speed with which it cuts. Made of special alloy steel to fit any trimmer. Sizes 5" to 10".

● You save three ways with *Silver Steel* paper knives. They give true, clean cuts—reduce your trimming costs. They spend less time in the grinding shop—reduce your production costs. They give more cuts per blade—reduce your re-tooling costs.

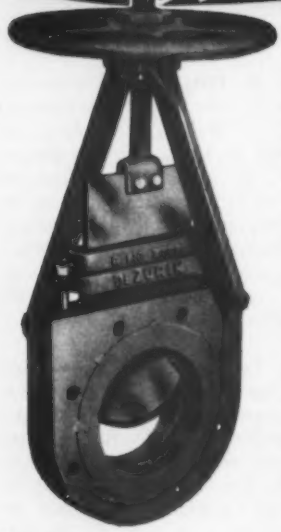
Call your Atkins Distributor now. Ask him to show you why thousands maintain, the finest paper knives made are Atkins *Silver Steel!*

ATKINS Silver Steel

BW

ATKINS SAW DIVISION
Borg-Warner Corporation — Indianapolis 9, Ind.

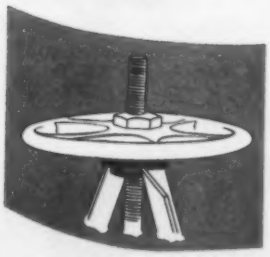
the finest in KNIFE GATE VALVES



On fibrous, viscous or slurry type flows — corrosive or non-corrosive — you'll want the advantages of DeZurik Fabricated Bonnetless Knife Gate Valves. Usual construction utilizes stainless steel in all wetted parts; various other combinations of materials are also available.

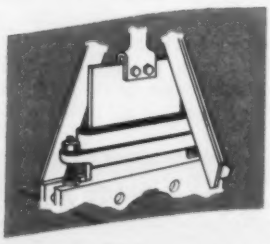
Their heavy body construction and thick gate prevent distortion and buckling under piping strains or line pressure. Their low cost, low maintenance and long life mean greater value.

In sizes 3" to 24"; wafer pattern (illustrated), standard gate valve face-to-face and short face-to-face (intermediate to wafer and standard dimensions.)



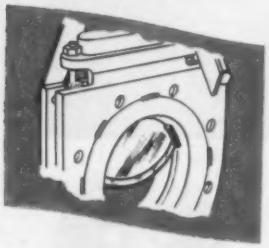
A large yoke head provides liberal bearing area for the operating nut. The 18-8 stainless steel stem has double-pitch threads for fewer turns of the hand-wheel and less wear on operating parts.

Hand-wheel, lever, cylinder and positioner operated models for throttling are also available.



The external ni-resist stuffing box is corrosion resistant to both acid and alkaline services. Its inverted design is self-aligning, eliminating side pressure on the gate and lowering the frequency of stuffing box adjustments.

The full-width top end of the gate extends through the gland, eliminating the usual bonnet cavity.



Heavy positive blocks guide the gate; they cannot break off to damage pumps or other equipment.

The lower end of the gate is sharpened to shear through fibers or other solid material in the flow.

The gate, and all other wetted parts, are stainless steel or other corrosion resisting material according to requirements.

The round port bottom eliminates the "corner cavities" of straight-bottom gate valves where solid material can pack and interfere with the full descent of the blade, preventing shut off.

Clean-out plates are unnecessary on DeZurik Gate Valves!

Write for more details.

DeZURIK CORPORATION
SARTELL, MINNESOTA

PATENT REVIEWS

MELVIN NORD*

Paper machine

U. S. 2,810,940, issued October 29, 1957, to Orrie J. Mills, describes improvements in the method of paper manufacture that permit greater production with less equipment and lower cost.

According to the invention, machines of higher speed and narrower width are capable of production equal to or greater than present machines. According to the novel features of this invention, the fourdrinier section and its auxiliaries and pit are eliminated; the handling of very large quantities of water is obviated; less dryers are required; there is much less steam consumption for drying, and there are no couch and wire marks in the paper.

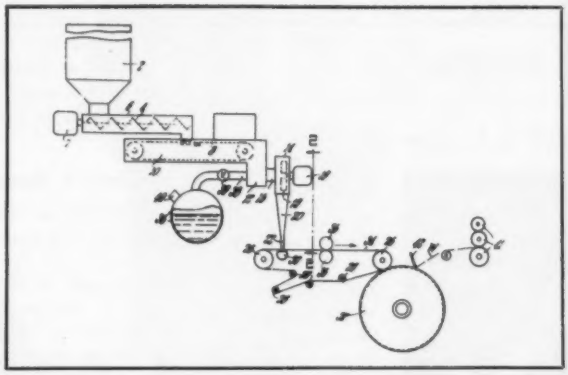


Fig. 1

A supply vat or stock chest 2 is shown in Fig. 1 for papermaking stock. For purposes of description, the paper to be produced will be considered lightweight or tissue paper. The stock will be prepared in much the ordinary manner so that it will provide a furnish for the basis weight paper to be produced. The stock, however, instead of including ½-1 per cent fiber as in the common practice, will be about 75 per cent of fiber and about 25 per cent only of water.

The stock is transported by a continuously-rotating screw 4 through a conveyor tube 6 onto an endless conveyor band 8 of a conveyor scale 10. The screw will be driven by a motor 7.

The stock on the band 8 is delivered to a compartment 12. A fan housing 14 connected to the compartment by a conduit 16 encloses a suction fan 18 operated by a motor 19. A delivery nozzle 20 terminates in a relatively wide delivery outlet 22.

An endless felt band 34 has an upper run supported and driven by rolls 26 and is otherwise guided by rolls 28. A suction box or suction roll 30 of suitable form is disposed below the band 24 at a point below the outlet 22.

A hollow cylinder 32 is rotatable adjacent the delivery end of the band. This cylinder is similar to that known as a Yankee dryer and is supplied with steam for drying purposes.

A tank 36 for water has an outlet conduit 38 to the compartment 12 and an air inlet 40 for the passage of air to the compartment 12. Rolls 41 represent the rolls of a calender stock of ordinary form.

Stock from chest 2 is delivered at such rate as to satisfy the weighing scale and may be accomplished by regulating the speed of screw 4.

The weighing scale will be of the type to continuously weigh the correct amount or volume of stock for the particular paper being formed, taking into consideration the basis weight of the paper being produced, the speed of band 34, etc. One form of such device is known as "Feedoweight" and manufactured by Merrick Scale Mfg. Co. of Passaic, N. J. Such devices operate continuously, and the adjustability thereof makes it possible to

*Patent attorney, 17600 Pinehurst, Detroit 21.

continuously deliver a predetermined weight of stock according to the basis weight of the paper to be formed.

The propeller 18 blows the stock from the compartment 14 down through the nozzle 20 and out the outlet 22 onto the band 34, which moves continuously in the direction of the arrow. The stock is pressed between the press rolls 36, and the web formed on the band passes onto the cylinder 32 by means of the pressing action of roll 26.

The cylinder 32 is heated by steam so that the formed web is dried, doctored and enters the calender.

The stock may be delivered to the band 34 in such a manner as to form a very thin or relatively thicker layer, depending upon the operation of the weighing device and speed of the band 34 in order to form the paper web desired.

In some cases it may be desired to add moisture to the fibers. This may be accomplished by opening a valve 39 in conduit 38. Here a fan 18 draws air from over the water in tank 36 so that moisture-laden air is mixed with the stock so that the fibers take on moisture.

Coagulation of lignin by freezing

U.S. 2,813,090, issued Nov. 12, 1957, to Frank J. Ball and assigned to West Virginia Pulp & Paper Co., describes a method of coagulating difficultly filterable lignin sols by freezing the sol to the solid state followed by thawing to room temperature.

Flame resistant hardboard

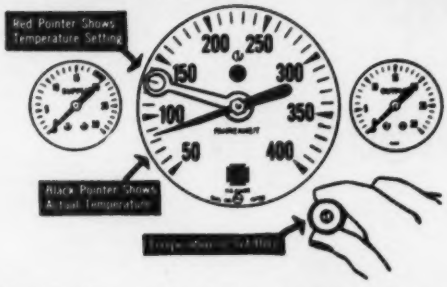
U.S. 2,813,046, issued Nov. 12, 1957, to Edgar A. Lauring, relates to fire-retarding coatings for fiberboard which are intumescent, i.e. which puff up upon heating, to form a foam which excludes the air and provides an insulation barrier. At the same time, the coating is washable and abrasion-resistant.

The intumescent coating includes a carbohydrate such as starch, urea, monoammonium phosphate and a film-forming polymer latex. A second coating superimposed on this coating contains a carbohydrate, urea resin and a polymer latex. A third coating contains urea formaldehyde resin and latex.

Other Patents of Interest to the Pulp and Paper Industry

Subject	Inventor or Assignee	Patent No.	Date
One-piece convertible container	David E. Kessler	2,810,506	10/22/57
Carton	Owens-Illinois Glass Co.	2,810,507	"
Sanitary non-refillable paper container	Aron Braunstein	2,810,508	"
Multi-ply bags with stepped corner flaps	St. Regis Paper Co	2,810,509	"
Bag closure	Meyer Korn	2,810,510	"
Process for drum-finishing coated paper	S. D. Warren Co.	2,810,966	10/29/57
Box machines	Alton Box Board Co	2,811,086	"
Carton setting up and assembling machine	Container Corp. of America	2,811,087	"
Wood defibering apparatus	International Paper Co.	2,811,183	"
Article carrier	Federal Paper Board Co. Inc.	2,811,279	"
Carton for supporting a container	River Raisin Paper Co.	2,811,295	"
Carton	River Raisin Paper Co.	2,811,296	"
Carton spout construction with closure	William W. Fitzhugh Inc.	2,811,297	"
Box of foldable sheet material	Container Corp. of America	2,811,298	"
Double-gusseted valve bags	St. Regis Paper Co.	2,811,300-1	"
Apparatus for transporting pulpwood	Northeastern Paper Products Ltd.	2,811,393	"
Alkaline refining of wood pulp to produce depolymerized cellulose	Rayonier Inc.	2,811,518	"
Envelope manufacture	United States Envelope Co.	2,811,905	11/5/57
Apparatus for assembling built-up pads with corrugated paperboard	Stone Container Corp.	2,812,006	"
Can carrier	Container Corp. of America	2,812,105	"
Dispensing containers	Paul J. Graybill	2,812,126-7	"
Flow detector for sheets of paper	National Research Council (Canada)	2,812,447	"
Mill for separating pith and fiber from stalky vegetable materials	Louisiana State University	2,812,552	11/12/57
Preparation of shredded wood pulp	Hercules Powder Co.	2,812,790	"
Combined shipping container and display case	Morton E. Samuels	2,812,852	"
Steel wool carton	S.O.S. Co.	2,812,853	"
Fibreboard reel-type package	Inland Container Corp.	2,812,854	"
		2,812,855	"

New wet end dryer control improves finish . . . helps stop picking, curling, cockling on all types of paper



Picking, curling and cockling of paper or board usually means one thing—poor temperature control on the first few wet end dryers.

The best way to end this problem is with the new Stickle automatic temperature control for individual wet end dryers.

This system makes it easy to set any temperature desired in each dryer. And once set, temperatures are maintained automatically, within 1% plus or minus.

The system shows at a glance the temperature set, actual temperature inside the dryer, flow and temperature of condensate leaving each dryer.

It is the fastest acting, the simplest and most accurate system ever developed for this purpose. Yet it costs less to install, less to operate and less to maintain than any other system. And, when installed as directed, the system is guaranteed to meet predetermined standards.

Write, wire or phone for details.

FREE!

Bulletin 560-A

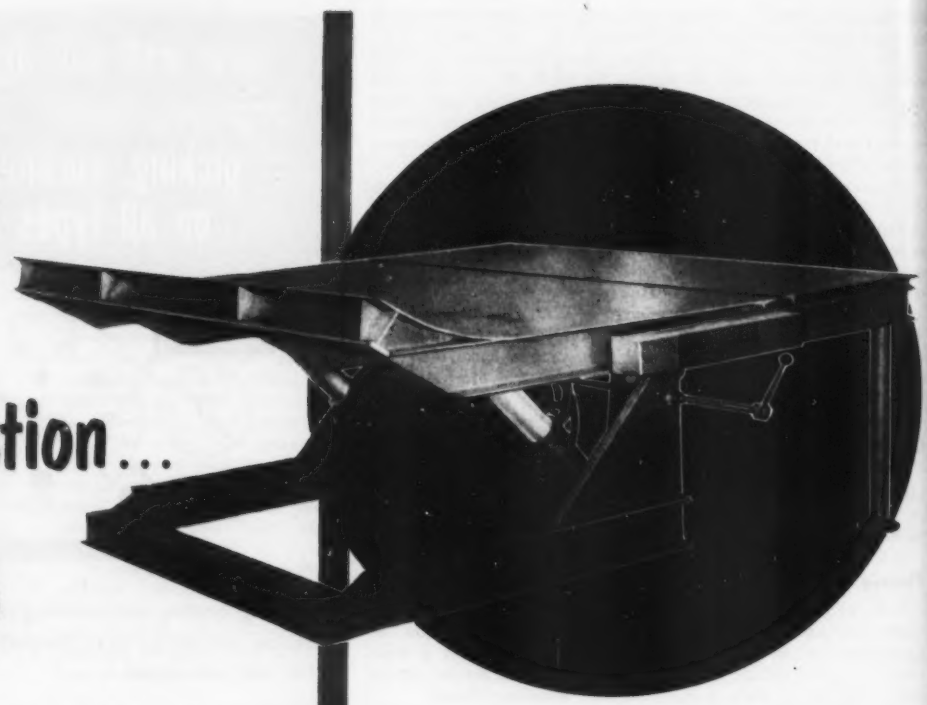
Shows at a glance the step-by-step operation of the new Stickle system for automatic temperature control of wet end dryers.

STICKLE STEAM SPECIALTIES COMPANY

2215 Valley Ave. • Indianapolis 18, Ind.

Moisture Control Systems
Dryer Drainage Systems
Feed Water Heaters
Vacuum Pumps
Micro Adjustable Orifices
Differential Control Valves

Speed up production...



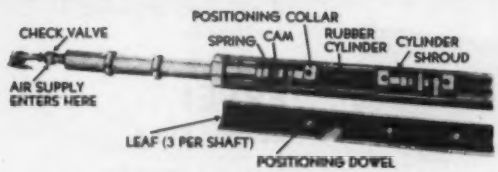
MURCO

MURCO

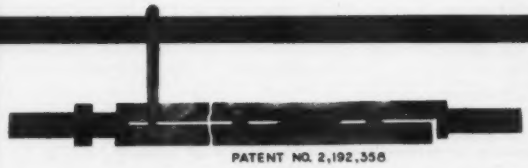
ROLL HANDLING EQUIPMENT

HYDRAULIC ROLL LOWERING TABLE

Portable, occupies small floor space . . . made in sizes practical for normal size paper rolls, and available in various lengths . . . quick positive reliable action . . . eliminates use of complicated expensive equipment, unloading tables or cumbersome overhead hoist arrangements . . . prevents paper roll damage. No bending or breaking of windershafts, as windershafts are not used as lifting arbor. Transfer of finished paper roll is simple and safe operation . . . to the time proven design of MURCO Hydraulic Roll Lowering Table has been added a bridge that raises and lowers to lengthen receiving portion of table and move it closer to the winder. Complete details upon request.



MURCO-COLLARD PNEUMATIC COLLAPSIBLE WINDERSHAFTS — Adaptable for winding or unwinding paper without mandrels, chucks, collars, keys, wedges or other accessories. Simple and rugged construction . . . few parts subject to wear . . . no damage to paper or cores . . . made in diameters and lengths practical for normal mill operations. Send us your specifications for quotations.



PATENT NO. 2,192,358

MURCO WINDERSHAFTS — Milled out of light metal . . . absolutely foolproof — cannot collapse while winding. Can be used for both winding and unwinding paper . . . adaptable for drum winding and slitters . . . will wind hard uniform rolls without distorted cores . . . easy and safe to operate . . . speeds assembly of cores and reduces work fatigue. Made to your machine specifications. Send us your specifications for quotations.

D. J. MURRAY MANUFACTURING CO.

WAUSAU • WISCONSIN

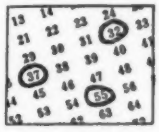
OUR 75TH YEAR
1883 TO 1958
75 YEARS OF SERVICE TO INDUSTRY

Serving The Paper Industry Since 1883

WANT MORE FACTS?

Use this Return Card

To obtain further information quickly—and at no obligation—on any item described in the New Products or Manufacturers' Publications sections of this issue, circle the corresponding number on the attached card. We will forward your request promptly to the manufacturer, who will send the information directly to you.



*Requests from outside the United States must be placed in envelopes, stamped and addressed to: Readers' Service Dept.

The PAPER INDUSTRY
431 South Dearborn St.
Chicago 5, Ill., U. S. A.

Readers' Service Department of The PAPER INDUSTRY

Please send me information or literature regarding the following checked items. The numbers refer to corresponding items appearing in the New Products and Manufacturers' Publications sections of this issue.

MARCH 1958

11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26
27	28	29	30	31	32	33	34
35	36	37	38	39	40	41	42
43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58
59	60	61	62	63	64	65	66
67	68	69	70	71	72	73	74
75	76	77	78	79	80	81	82
83	84	85	86	87	88	89	90

Please print or type the information below

Name

Title

Company

Address

City State Countr

Postage Will be Paid by Addressee

No Postage Stamp Necessary If Mailed in the United States

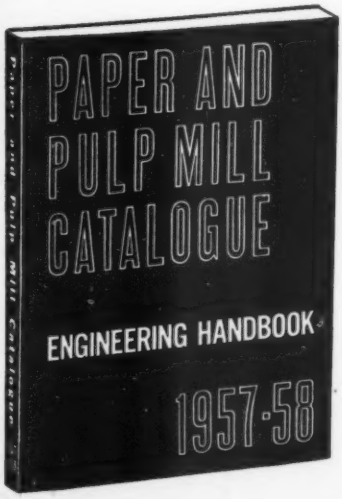
BUSINESS REPLY CARD
FIRST CLASS PERMIT NO. 1704 — CHICAGO, ILLINOIS

Readers' Service Dept.

***The* PAPER INDUSTRY**

431 South Dearborn St.

Chicago 5, Ill.



34TH EDITION

ON THE DESKS OF MEN WHO SPECIFY AND BUY IN . . .

Every operating paper and pulp mill in the United States and Canada

A one-volume, composite Catalogue or permanent classified Reference File of manufacturers' catalogues, a Buyers Service Section, and the Engineering Handbook. Published annually in September.

This book provides a quick, "easy to use and order from", all-inclusive service which eliminates searching through files for individual catalogues and engineering books.

(Continued on opposite side)

Postage Will be Paid by Addressee

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY CARD
FIRST CLASS PERMIT NO. 1704 — CHICAGO, ILLINOIS

Readers' Service Dept.

***The* PAPER INDUSTRY**

431 South Dearborn St.

Chicago 5, Ill.

Readers' Service Department of The PAPER INDUSTRY

Please send me information or literature regarding the following checked items. The numbers refer to corresponding items appearing in the New Products and Manufacturers' Publications sections of this issue.

MARCH 1958

11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26
27	28	29	30	31	32	33	34
35	36	37	38	39	40	41	42
43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58
59	60	61	62	63	64	65	66
67	68	69	70	71	72	73	74
75	76	77	78	79	80	81	82
83	84	85	86	87	88	89	90

Please print or type the information below

Name

Title

Company

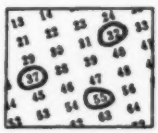
Address

City State Country

WANT MORE FACTS?

Use this Return Card

To obtain further information quickly—and at no obligation—on any item described in the New Products or Manufacturers' Publications sections of this issue, circle the corresponding number on the attached card. We will forward your request promptly to the manufacturer, who will send the information directly to you.



*Requests from outside the United States must be placed in envelopes, stamped and addressed to: Readers' Service Dept.

The PAPER INDUSTRY
431 South Dearborn St.
Chicago 5, Ill., U. S. A.

OVER 500 PAGES OF INDISPENSABLE INFORMATION

CONTENTS:

- **Manufacturers Catalogue Section** — contains pages and complete inserts giving information and data on products of individual manufacturers. Pages appear in alphabetical order by names of manufacturers.
- **Buyers Service Section** — includes a comprehensive, cross-reference list of machinery, equipment, materials and chemicals with names of responsible manufacturers and suppliers; a list of trade names; complete addresses of all firms that are listed in the Section; and a directory of educational institutions in the United States and Canada having courses of instruction in the manufacture of pulp and paper.
- **Engineering Handbook Section** — a compilation of practical engineering data, formulas, graphs, charts, tables, etc., including a section dealing with uses and hazards of chemicals used in pulp and paper making. New material added yearly.

Paper and Pulp Mill Catalogue
is published by . . .

FRITZ PUBLICATIONS, INC.
431 South Dearborn Street
Chicago 5, Illinois

NEW PRODUCTS

These items are numbered for your convenience. Further information on the various products described may be requested at no obligation through our Readers' Service Dept. Use the business reply card in this issue.

Moisture control system

Stickle Steam Specialties Co. has announced several improvements in the company's moisture control system—the Pres-Ten-Trol.

Improvements include a new reset unit to stabilize operation of the tension roll, redesigned pilot valve to reduce maintenance and outside set point knob for instant adjustment of desired steam pressure.

The control panel of the system houses controls and instruments for regulating, indicating and recording steam pressure in the dryers and moisture variation in the sheet. A 24-hr. chart provides a permanent record of each run. *Stickle Steam Specialties Co.*

Circle No. 11 on Readers' Service Card

Medium-density polyethylene

As compared to low-density conventional-type polyethylene, the manufacturer has stated that the use of Series 100 Tenite polyethylene means greater stiffness, higher heat resistance and greater resistance to abrasion in molded products.

It has also been stated that paper coaters can expect to produce a laminate which will meet requirements of government specifications on grease resistance.

More technical information about this new polyethylene is offered by *Eastman Chemical Products Inc., Eastman Kodak Co.*

Circle No. 12 on Readers' Service Card

Materials handling machine

This machine, the Scoopmobile, is now being used in a pulp and paper mill and is handling 20 carloads of wood chips a day.

The Scoopmobile is powered by a 175-hp engine, has four-wheel planetary drive and four-wheel steering. *Mixermobile Mfrs. Inc.*

Circle No. 13 on Readers' Service Card

Steel floor plate

The photo shows the use of steel floor plate in an area where materials handling equipment was causing surface chipping and crumbling of concrete floors.

Installation of steel floor plate has now provided this area with a safe surface and has eliminated high maintenance costs.

The steel floor plates consist of an 11¾-in. square plate of .068-in. hot-rolled steel. Each plate contains 100 small rectangular holes of approximately ½ × ¾ in. and 100 barbed prongs ¾ in. long. *Acme Steel Co.*

Circle No. 15 on Readers' Service Card

Polyvinyl acetate emulsion

A new resin called Resin D-702 is a spray dried product and is suggested for use in adhesives where dextrine compatibility and borax-tolerance have numerous applications. It is also suggested for use with borated dextrines in case and carton sealing adhesives.

When this dry mixture is added to water, Resin D-702 is said to redisperse rapidly as the dextrine dissolves, yielding a product similar to that obtained when dextrine is added to a dextrine-compatible polyvinyl acetate emulsion. *Shawinigan Resins Corp.*

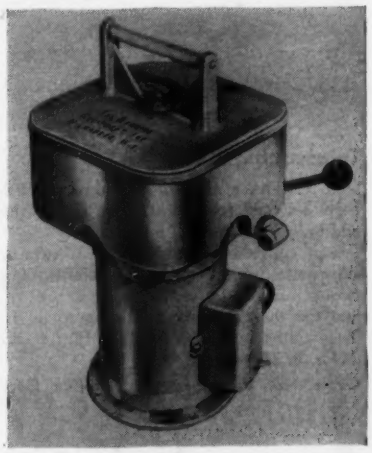
Circle No. 14 on Readers' Service Card

Electro-magnetic clutch

Heavy-duty, electro-magnetic clutches for use on ball mills, rod mills, compeb mills and kilns have been announced.

These clutches have a maximum torque of 120,000 ft. lbs and 4878 sq. in. of lining area. The company invites your request for more technical information on these clutches. *Stearns Electric Corp.*

Circle No. 16 on Readers' Service Card



Electric motor pump

A portable hydraulic motor pump has been developed for use wherever hydraulic power is used or can be used to replace mechanical power.

Weighing only 65 lb., this pump is rated for 10,000 psi intermittent and 5000 psi continued duty delivering 80 cu. in. of oil per minute. It is driven by a standard

New Products . . .

½-hp single-phase, 60-cycle, 1750-rpm 110-220 volt motor. *Tal Bending Equipment Inc.*

Circle No. 17 on Readers' Service Card

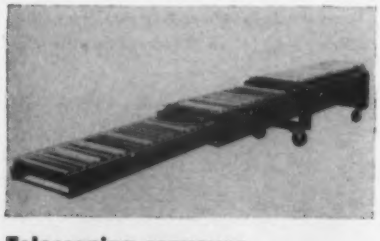
Continuous digester

An announcement has been made of a new concept in continuous pulping involving a newly-designed continuous digester.

This digester is really two independent operating units in one. Each of the digester halves is divided into an upper and lower section.

Presteamed chips pass through a specially-designed rotary valve, which brings them into the pressure zone of the digester without temperature or pressure losses. As the chips pass along the perforated metal trough in the digester, they receive a continuous spray of cooking liquor, the strength of which is kept constant by additions of white liquor. As the chips reach the end of the trough, they drop by gravity to another conveyor in the trough just below and are carried back to the other end of the digester for discharge. Cooking time in the digester is approximately 10-15 min. for semichemical, 30-40 min. for kraft or bleach-type chemical pulp. *Sprout-Waldron & Co. Inc.*

Circle No. 18 on Readers' Service Card



Telescoping conveyor

A cantilever telescoping conveyor has been designed for industry use in loading and unloading material into trucks.

The conveyors are available in two or three telescoping cantilever sections. The two-section model extends up to 18 ft., and the three-section extends up to 30 ft. The widths can be ordered in 12, 18 and 24 in. *Wilkie Co.*

Circle No. 19 on Readers' Service Card

Interfloor conveyor

An announcement has been made of the development of an automatic interfloor handling system which conveys material either up or down from any one floor to any other floor at the touch of a button.

Controlled versatility of the system enables five different conveying cycles from the one conveyor: (1) Full Automatic; (2) Up Only; (3) Up-Down; (4) Down Only, and (5) the manual operation used for service and maintenance operations.

Featuring a foolproof "thinking" panel, an operator can tell by means of signal lights just where a load comes from and where it is going. Thus, loads cannot be misdirected. *Gifford-Wood Co.*

Circle No. 20 on Readers' Service Card

Baling press

Pictured above is a new portable horizontal hydraulic baling press which has just been developed. This press will be known as the Lake Baler.

Materials are fed into the press through a large hopper opening in the top of the press. This hopper is 36 in. above the floor and measures 26 × 30 in.

This all-steel press stands 36 in. high, 110 in. long, 34 in. wide and weighs 1000 lb. It is mounted on roller bearing casters permitting easy movement from one location to another. The hydraulic system is powered by a 3-hp electric motor.

Bales produced by the machine measure 24 × 30 × 30 in. Finished bales will be tied with twine in a semi-automatic operation. This feature makes baling wire completely unnecessary and reduces the time required for bale-tying.

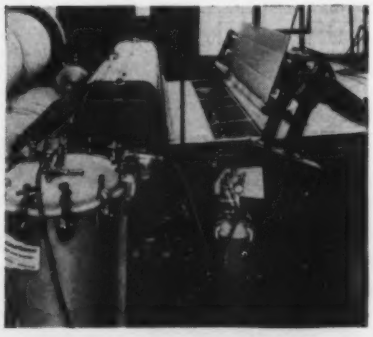
Finished bales are automatically ejected from the press. *Lake Engineering Sales Co.*

Circle No. 22 on Readers' Service Card

BCF exchangers

An expanded line of type BCF exchangers is now available. The new line is now offered in 46 sizes—one-, two- and four-pass designs and 1.2-124 sq. ft. of heat transfer surface. *Ross Heat Exchanger.*

Circle No. 21 on Readers' Service Card



Applicator for applying non-skid coatings directly at the corrugator

An entirely new system for applying effective non-skid coatings directly at the corrugator improves the quality of printing and reduces over-all cost.

Gun controls have a range of adjustments to provide fan pattern control, atomizing control, plus proper texture of mixture to provide a slip-resistant surface for virtually all types of fiber and corrugated work. *Ortman-McCain Co.*

Circle No. 23 on Readers' Service Card

Double suction fire pumps

Expansion of the company's line of single-stage, double suction pumps for fire or booster service has been announced.

New additions to the line are 6- × 5-in. units (Type KSIF) rated 1000 gpm at pressures from 60 to 100 lbs., an 8- × 8-in. pump rated 2000 gpm at pressures from 60 to 100 lbs., and a 10- × 8-in. unit (Type SHF) rated 2500 gpm, 100 lbs. pressure, 1760 rpm.

The complete line of enclosed impeller pumps is approved by Underwriters' Laboratories and Associated Factory Mutual Companies. *Allis-Chalmers Mfg. Co.*

Circle No. 24 on Readers' Service Card

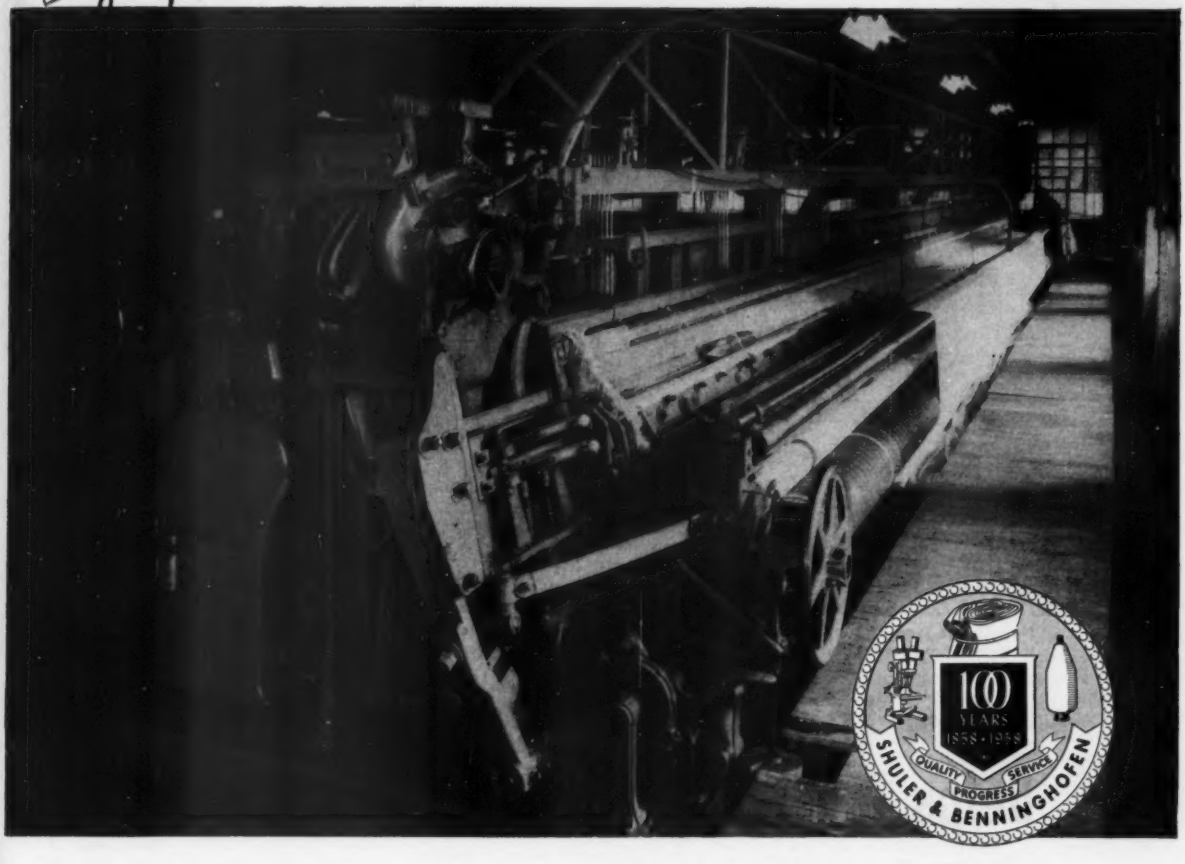
Balancer

A new machine for the dynamic balancing of rotors has been named the Raydyne Automic System. This machine uses a seismic-mounted, electronically-controlled unbalance indicator with a force absorption device which automatically stops all motion caused by unbalance and affords accurate balance testing with the first run of the rotor.

This new model embodies the original principles with addition of improved de-

HAM FELTZ explains:

"Why a 100 Year Old Company Buys The Biggest Loom in America."



"MANY A 100 year old company
may like to sit on its laurels
and keep producing as it did in the past

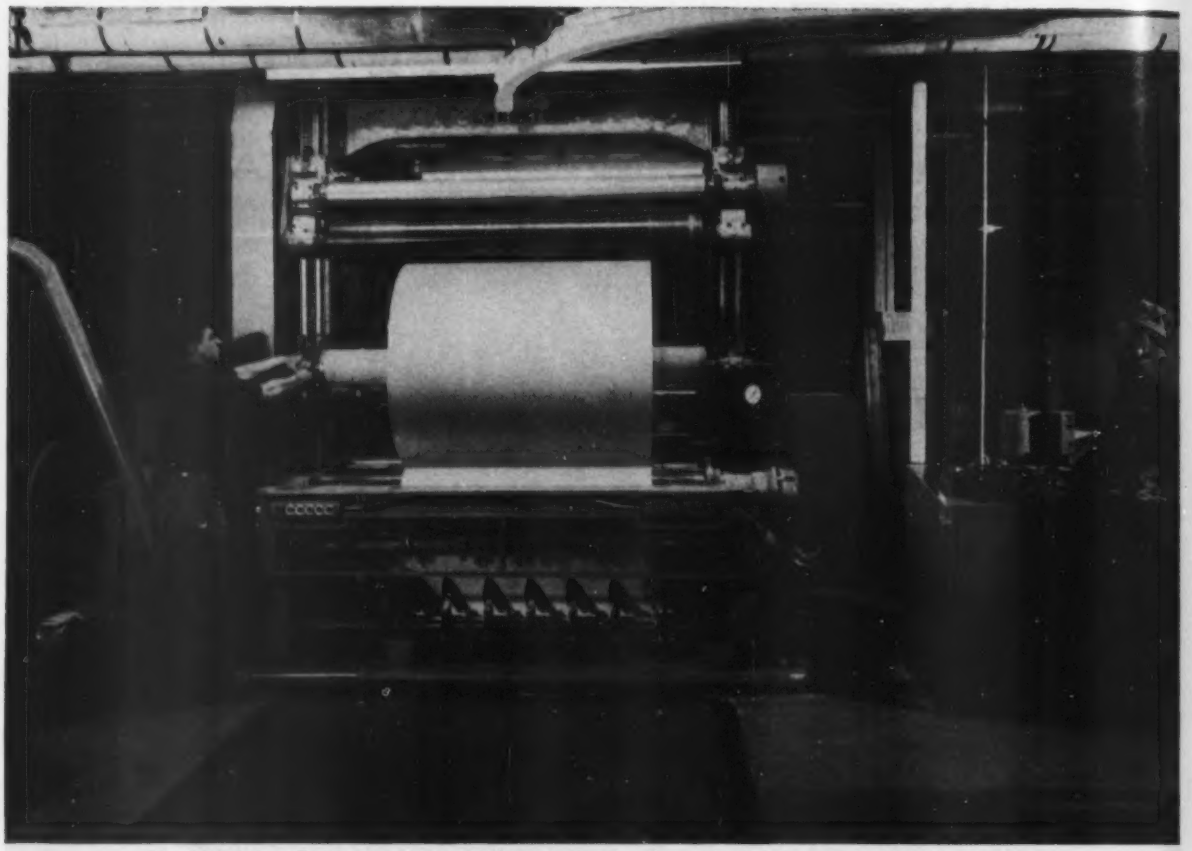
But NOT the makers of Hamilton Felts !

"They've just installed this new giant loom
with a reed space of 726 inches
—the widest felt loom, we believe, in America.
Now Hamilton Felts can be produced
to meet the needs of all board and paper mills
which may require felts not only of
unusual qualities* but unusual measurements.
It's no wonder that, after 5 generations
you can't beat Hamilton Felts."

**"If you have a problem in paper or board making that one of our 300 proven styles won't solve, we will be happy to design a felt that will. Why not talk it over with your Hamilton Felt Service Salesman—or write us direct—today?"*

YOU CAN'T BEAT
Hamilton
FELTS

SHULER & BENNINGHOFEN
HAMILTON, OHIO • *Fine Blankets Since 1858*



New 72-inch Type CA Langston Slitter and Winder in Marathon Corporation finishing room handles rolls up to 60 in. in diameter at speeds up to 1500 ft. per minute. Finished rolls are lowered by hydraulic drop shown in foreground.

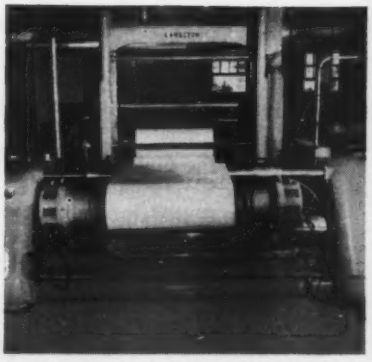
New Langston Slitter and Winder helps Marathon cut operating costs

This new Langston Slitter and Winder installation at Marathon Corporation's Rothschild, Wis., mill is already helping the company cut costs and speed processing of quality paper and board.

For example, the power-operated shaftless unwind stand virtually loads itself. No crew is needed to bull heavy shafts into place. And the Langston hydraulic roll ejector permits 1-man removal of finished rolls. These two features alone are saving Marathon several thousand dollars a year. Water-cooled Wichita-type air brakes can be operated from control console.

Besides effecting major operating economies, these Langston machines also pay off in higher quality rolls. The hydraulic rider roll control, for instance, automatically keeps nip pressure constant, regardless of the diameter or weight of the rewound roll. This insures rolls of uniform density with reduced tendency toward wrinkling or telescoping. The shear-cut slitters cut like scissors instead of a knife, shearing cleanly and keeping paper dust to a minimum. The resulting clean-edged, dustfree rolls are easier for customers to process.

Learn how you can benefit from the advantages of Langston Slitters & Winders. Write SAMUEL M. LANGSTON CO., 6th & Jefferson Sts., Camden 4, N.J.



Langston Shaftless Unwind Stand eliminates the time-consuming, back-breaking task of hoisting heavy shafts into place. The hydraulically actuated arms reach out, pick up the roll and lift it to running position—a 1-man, push-button operation.

LANGSTON Leadership...by design

New Products . . .

vices resulting from the company's research and engineering program. *Raydyne Corp.*

Circle No. 25 on Readers' Service Card

Screwdriver with built-in flashlight

Here is a screwdriver with a built-in flashlight. This unique design gives light on the spot where it is needed when working in dark places.

The unit comes complete with leatherette case including four interchangeable bits, two Phillips head screw drivers and a removable chuck. Because of the interchangeable pieces, the flashlight unit (which takes standard flashlight cells) can be used with or without the tools attached. Over-all length of the unit with screwdriver is 10½ in. *Silver Bells Ltd.*

Circle No. 26 on Readers' Service Card

Adhesive for packaging paper rolls

Angier AL-523 is the name given to a new adhesive which has been developed for use in packaging huge rolls of paper.

An extensive study has been made to solve the problem of damaged or spoiled rolls due to inadequate glues used in packaging huge rolls. This new sprayable water base adhesive is believed to solve this problem.

Immediate fiber-tearing bonds are obtained without the use of heat or special pressure devices. It also has the ability to grab fast and hard almost as soon as it is applied. *Angier Adhesives Div., Interchemical Corp.*

Circle No. 27 on Readers' Service Card

Versatile cellulose for staple fiber

Rayofiber is a new advancement in basic materials for the manufacture of all grades of staple fiber.

In any type of viscose equipment, Rayofiber yields good viscose processing performance. In slurry steeping, the fibers of this new chemical are sufficiently long to promote free draining and ease of pressing without excessive carry-through of fibers.

Rayofiber is now ready for shipment in commercial quantities from *Rayonier Inc.*

Circle No. 28 on Readers' Service Card

Cylinder mold

A cylinder mold of new and improved design has been introduced to the industry. It is built on heavy cast iron centers and is said to differ in a number of important respects from conventional cylinder molds.

A series of standard designs up to 14-ft. face and diameters of 30, 36, 42 and 48 in. are available, and special designs to meet unusual operating conditions can be quoted on request. *Layton-Greenfield Inc.*

Circle No. 29 on Readers' Service Card

Polypropylene

This polypropylene, known as Pro-fax, is made from a petroleum by-product, propylene gas.

Pro-fax has excellent resistance to grease and oil, water and many common acids. The company has also stated that Pro-fax has a much higher tensile strength, hardness, temperature resistance, stiffness, resilience and clarity. *Hercules Powder Co.*

Circle No. 30 on Readers' Service Card

Automatic dockboard

A new concept in dockboard design is the installation of a new Hi-Lo automatic dockboard to existing truck docks. This new model is simply bolted to the top of the dock.

A counterweighting system is mounted on the face of the dock between two bumpers. No electrical, air or hydraulic power is required.

In operation, the backing truck automatically lowers the ramp to the working position. After loading operations are completed the ramp automatically returns

NOW—CHECK ACCURACY WHILE YOU CHECK MOISTURE!

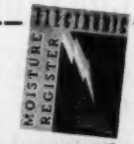
New Electronic Moisture Registers have first "built-in standard" in a 3-second, portable moisture tester.

NOW DIAL ACCURACY IS ASSURED, even under the extremes of production-line use. With *self-checking standard*, Moisture Register's new Model 5's are checked and adjusted for calibration accuracy right on the job—by any untrained operator. He simply fits electrode to standard. Then with new trimmer he sets dial for perfect alignment. Gives calibration adjustment *in the field.* You get practical accuracy down to 0% . . . 3-second spot tests for moisture wherever your product may be. Portable, light weight, battery operated, new rugged construction with miniature tube. Factory-set to your needs.

For faster testing of—

- Paper Stock
- Paperboard
- Insulation boards
- Paper Bags
- Plastics

SEND FOR NEW TECHNICAL DATA and information on 2-week free trial.



ELECTRONIC MOISTURE REGISTER *Instruments*

Moisture Register Company, Dept. PI
P. O. Box 910, Alhambra, California
Please send data on new Model 5's.

We are testing _____

in moisture range from _____% to _____%

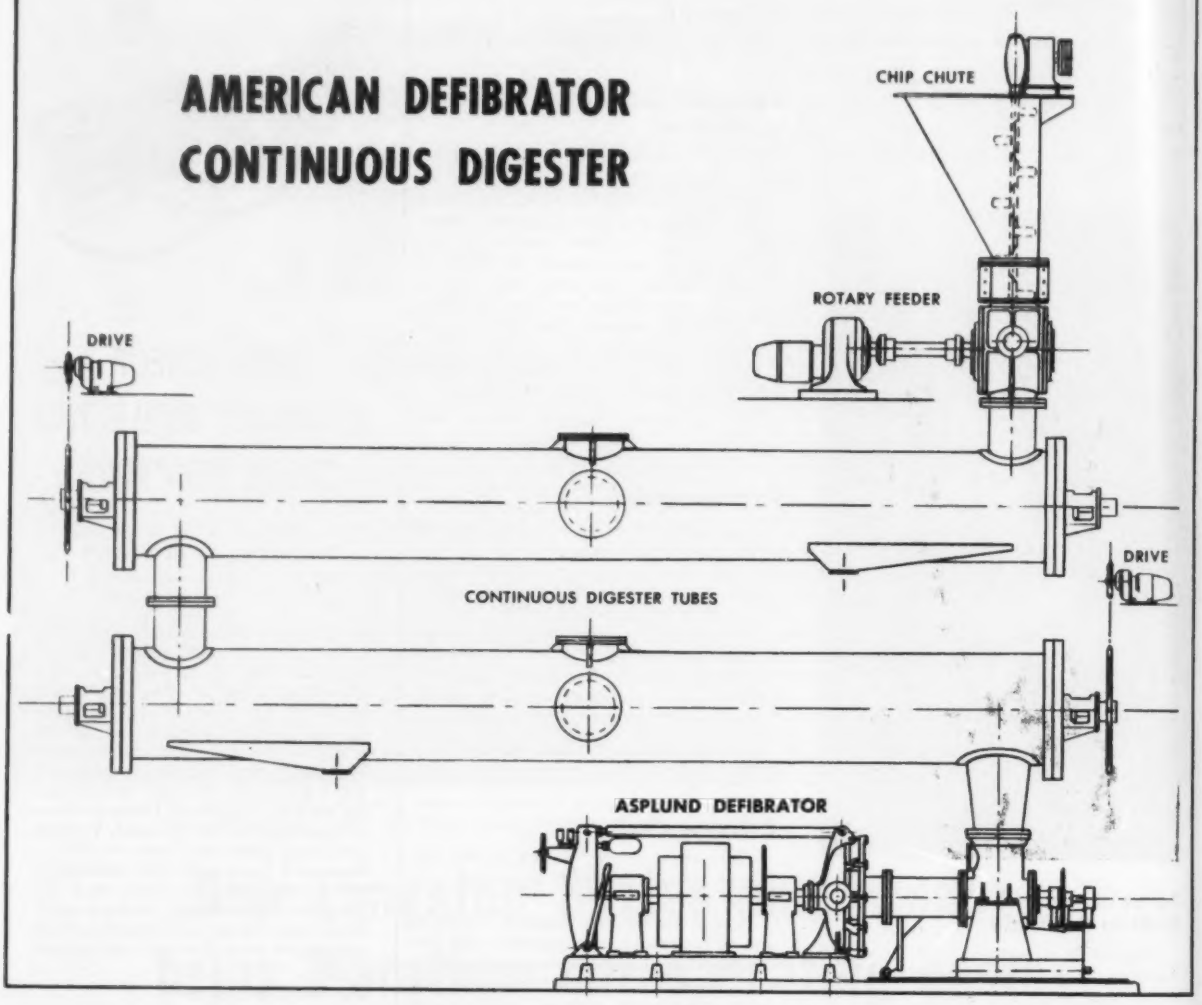
Firm _____

By _____ Title _____

Address _____

City _____ State _____

AMERICAN DEFIBRATOR CONTINUOUS DIGESTER



CONTINUOUS PULPING WITH AMERICAN DEFIBRATOR EQUIPMENT CONTROLS BOTH COST AND GRADE OF PULP FOR THE PAPER INDUSTRY

More and more mills are selecting American Defibrator continuous digesters and related equipment for continuous semi-chemical pulping — for economical production of controlled grades of pulp for the Paper Industry.

American Defibrator continuous digesters with Asplund Defibrators produce pulp ready for washing and secondary refining, at substantial savings in handling and power costs.

Raw materials range from hardwoods and softwoods to cotton linters and bagasse. Various cooking agents may be used, such as neutral sodium sulfite, kraft or caustic soda liquors.

Units are available with capacities from 50 to 200 tons per day.

Present use is mainly for corrugating boards, but bleachable grades now are also being produced.

AMERICAN DEFIBRATOR, INC. CHRYSLER BUILDING NEW YORK 17, N. Y. West Coast: A. H. Lundberg Mercer Island, Washington

to its original position ready to service the next carrier.

Standard models are 6 ft. and 8 ft. wide and 10 ft. long with roll-over capacity of 12,000 lbs. *Kelly Co. Inc.*

Circle No. 31 on Readers' Service Card

Steam sample condenser

The unit pictured above is a steam sample condenser which is used to condense high-pressure super-heated steam for certain specified service conditions.

The company states that the paper industry can utilize this steam sample condenser as a liquid sample cooler due to the fact that these units are provided with a ⅜-in. O.D. double cooling coil operating in parallel.

The unit is said to condense and cool 1 lb. steam per minute from 1000° F., 3500 psi to 10° F. above cooling water inlet temperature. *Technical Engineered Products Inc.*

Circle No. 32 on Readers' Service Card

Fire pump attachment

A high-pressure pump attachment for mopping-up operations following a forest fire has been designed and on the market.

The company has stated that tests show a delivery of approximately 10½ gpm against 225 lbs. pressure through a 3/16-in. nozzle at 3850 rpm. The pump attachment complete with mounting base weighs approximately 15 lbs. *Bishop Co.*

Circle No. 33 on Readers' Service Card

Polyethylene extrusion laminator

A new model laminator for extrusion coating of polyethylene film to various web materials such as cellophane, Mylar, aluminum foil, paper and paperboard has been developed.

The model is known as the PL-600 and is offered in widths of up to 100 in. at speeds to 1000 fpm. *Black-Clawson Co.*

Circle No. 34 on Readers' Service Card

Polyvinyl chloride-acetate copolymer emulsion

The first polyvinyl chloride-acetate copolymer emulsion designed for good adhesion characteristics is now being marketed.

Known as Resyn 2507, this emulsion is said to be unique because it does not require additives or thickeners to increase viscosity, nor pre-emulsification of plasticizers. *National Starch Products Inc.*

Circle No. 35 on Readers' Service Card

Resin adhesives

The following new resin adhesives for laminating Mylar and treated polyethylene have been announced.

Resyn R30-1246 is recommended for laminating metallized Mylar to calendered vinyl film. This adhesive is a synthetic resin-based lacquer type and is clear and colorless.

Resyn R36-6327 is a synthetic, rubber-based lacquer which is used for such applications as laminating treated polyethylene to clear Mylar and all saran coated films.

Resyn R36-6328 is a synthetic, rubber-based lacquer recommended for laminating clear Mylar and metallized Mylar to themselves and to paper. *National Adhesives Div., National Starch Products Inc.*

Circle No. 36 on Readers' Service Card

Suction-type floor cleaner

The photo above shows the use of the Floormobile in a western paper mill in picking up scrap paper.

The unit is said to clean at the rate of 20,000 sq. ft. per hr.

A unique "litterdoor" attachment is part of the pickup nozzle and is opened

FLIPPING the LINT OFF "FLIP-TOPS"

Jenkins' METLKOR Web Cleaning Brush of DuPont Tynex Nylon

The gravure production plant of the Downingtown Paper Box Company, Downingtown, Pennsylvania is an engineering triumph. Here, Marlboro "flip-tops" are produced on Champlain presses at speeds up to 2400 cartons per minute.

HERE'S WHAT THE DOWNINGTOWN PAPER BOX COMPANY SAYS: Mr. George J. Wolfer, Gravure Supt. says: "Jenkins' METLKOR brushes are contributing to the overall economy and quality that is so important to our production. When we reorder brushes, they will be Jenkins' METLKORS."

HERE'S WHAT THE MANUFACTURERS OF THE CHAMPLAIN INLINE GRAVURE EQUIPMENT, OF BLOOMFIELD, N. J., SAY: "The Jenkins' METLKOR brushes used in the web cleaning process of our Champlain inline gravure equipment are superior in performance and efficiency and are providing satisfactory and economical operation for our customers all over the world."

JENKINS' BRUSHES FOR PRINTERS

Dampener Roll Cleaning • Cylinder, hold down • Web Cleaning • Dusting • Removal of anti-offset powder • Feed. PAPER MILL BRUSHES: Conveyor Cleaning • Blanket Washer • Fourdrinier Wire Cleaning • Polishing • Coating • Dusting • Dampening • Spray • Sieve • Feed or Carrier • Static Elimination • Flocking • Felt Cleaning • Paint Brushes • Floor Sweeps • Void Detector

Specify Jenkins' METLKOR the original . . . the best *Metal Core* brush

METLKOR® CYLINDER BRUSHES and LIFEWOOD® WOOD BACKED BRUSHES

M. W. JENKINS' SONS, INC.
— Serving Industry for 80 Years —
542 Pompton Ave., Cedar Grove
Essex County, N. J. • CEnter 9-5150

Save Man Hours

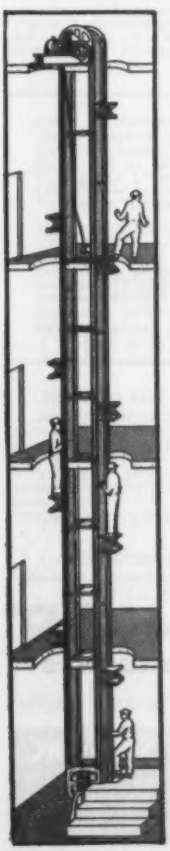
Equip Your Digester House with a

HUMPHREY

Employee's Manlift

ELEVATOR

Eliminate stair climbing — save time — reduce employee fatigue. The endless belt provides continuous up and down transportation to and from sampling and operating floors. Easy and safe to operate with ready-at-hand stop and go controls and the exclusive Humphrey Safety Features.



Can be installed in any Multi-Floor Building

Send us your requirements . . . we'll furnish complete information and prices.

HUMPHREY ELEVATOR COMPANY

Inc.

344 1st Ave. N.W.

Faribault, Minnesota

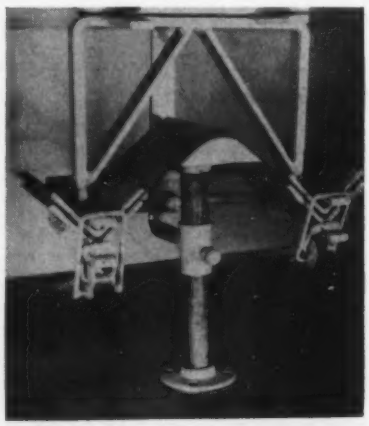
Humphrey is the original Manlift Elevator, made continuously since 1887.

New Products . . .

by remote control. As the unit cleans a floor, the operator can open the litterdoor without stopping or slowing down. Milk cartons, paper cups, excelsior, wads of paper, etc. are sucked up and deposited in the machine along with other dirt from the floor.

The Floormobile has cut time over the conventional push brooms and also provides superior results. *Handling Devices Co. Inc.*

Circle No. 37 on Readers' Service Card



Device for testing corrugated containers

Bathurst Power & Paper Co. Ltd. has invented a device used in determining the strength of the manufacture's joint in corrugated containers.

This device exerts a force upon the joint similar to that experienced by the container when actually carrying a full load of canned goods. Much information can be obtained regarding the ultimate strength of the box by using this device.

The manufacturer and distributor of this Bathurst Manufacturer's Joint Tester is *Testing Machines Inc.*

Circle No. 38 on Readers' Service Card

Chrome-ferrous castings

A highly alloyed foundry product devised to produce castable shapes and designed to resist extreme abrasive service has been developed and manufactured.

When used for severe wear parts such as agitators, mixers, paddles, screw feeders and similar items these castings are said to have unusually long service life. *Calumet Steel Castings Corp.*

Circle No. 39 on Readers' Service Card

Stainless steel fittings

Announcement has been made of a complete standard line of cast stainless steel fittings designed for services to 2500 psi at 670° F.

These fittings, available in both the 300 and 400 alloy series stainless steel in sizes 8 in.-30 in., include 45 and 90 elbows, tees and reducing fittings. *Cooper Alloy Corp.*

Circle No. 40 on Readers' Service Card

Powders for paper coatings

A wide range of attractive bronze powders is being offered especially for paper coatings.

Standard shades of copper, pale gold, rich pale gold, rich gold and green gold are available. In addition, 20 other shades including several reds, coppers and silvers will be made to order at no extra cost.

These powders are suitable for both pyroxylin and casein applications. *Hummel Chemical Co.*

Circle No. 41 on Readers' Service Card

Liquid ring pump

A new self-priming liquid ring pump for transfer applications has been introduced to the industry. Lightweight, quick and positive self-priming action and ability to handle air alone, liquid alone, or a combination of air and liquid provide maximum utility for this pump.

This pump is available with motor for permanent installations or mounted on heavy-duty casters for portable utility use. *Goulds Pumps Inc.*

Circle No. 42 on Readers' Service Card

High-power transistorized megaphone

The photo above shows a new, fully-transistorized megaphone which is very versatile in operation and application.

The effective range of the megaphone varies from ¼ to ¾ of a mile—depending on ambient noise level. To operate, one merely squeezes the trigger on the pistol grip or the "press-to-talk" button on the detachable microphone. Primary power comes from standard flashlight cells or through a simple adaptor from external source of 12- or 6-v dc. A full line of accessories is also available to expand its versatility. *Motorola Inc.*

Circle No. 43 on Readers' Service Card

NEW LITERATURE

Books

ELECTRONIC CIRCUITRY FOR INSTRUMENTS AND EQUIPMENT. By Milton H. Aronson. Published by Instruments Publishing Co., Pittsburgh 12, Penn. 305 pages. $2.00.

The material appearing in this text originally ran serially in the magazine, *Instruments & Automation*. The text is divided into 15 chapters, which cover the following subjects: fundamentals, vacuum tubes, rectification and power supplies, amplifier circuits, solid-state amplifiers, oscillator circuits, signal-shaping circuits, electrical and electronic test equipment, r.f. communication and television, scientific and industrial instruments, and military electronics.

Photographs and line drawings are shown throughout the book.

PROPERTIES AND TESTING OF PLASTICS MATERIALS. By A. E. Lever and J. Rhys. Published by Chemical Publishing Co. Inc., 212 Fifth Ave., New York 10, N. Y. 197 pages. $4.75.

The authors of this book have attempted to provide a source book or reference work for those engaged in the testing of plastics.

With all available information on the behavior and methods of testing plastics, resulting in a thoroughly practical reference work, the user of this volume is able to study particular problems without the necessity for extensive search of the literature on the subject.

A few of the main topics covered are general principles, physical, thermal, optical and electrical properties, identification and analysis, industrial materials and efficiency of plasticizers. It contains over 1600 references and a comprehensive glossary.

EMULSIONS—THEORY AND PRACTICE. By Paul Becher. Published by Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y. 382 pages. $12.50.

In this book all modern developments in the theory and practice of emulsions are clearly explained. It begins with the facts and theories of surface chemistry relevant to emulsions and the physical properties of emulsions as a function of emulsion composition.

The volume also contains discussions of the chemistry of emulsifying agents, emulsifier efficiency as a function of composition and the technique of emulsification, including the various types of emulsators.

POLYURETHANES. By Bernard A. Dombrow. Published by Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y. 176 pages. $4.50.

Realizing the importance of correct application in the whole gamut of plastics activity, Reinhold Publishing Corp. has decided to publish a series of short booklets emphasizing the applications of the various types of commercial materials of the plastics industry—each book to cover one type of material. This volume is the second in this series.

The remarkable uses and possibilities of the polyurethanes are thoroughly portrayed in this book. It includes their many applications as foams and as coatings, rubber and adhesives.

The presentation is clear and relevant so that even the non-technical man can visualize the unlimited possibilities in store for these polymers, and a help in finding new and improved production materials.

SYMPOSIUM ON STRUCTURAL SANDWICH CONSTRUCTIONS. Published by American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. 103 pages. $2.00.

The testing of materials and the application of sandwich construction are discussed in ten papers, including an introduction. High-temperature testing is dealt with in several papers. Two papers discuss adhesive bonds, including metal-to-metal and metal-to-resin adhesion.

The papers and discussions in this symposium were presented at two sessions of the second ASTM meeting in Los Angeles, Calif., in September 1957. In addition to these papers, the paper by Richard E. Anderson (which was presented at the session on plastics) is included in this symposium because of its close relationship to the subject.

Graphs and photos are included throughout the book to further illustrate the discussions.

USDA Reports

SILVICAL CHARACTERISTICS OF SCARLET OAK. The Southeastern Forest Experiment Station has prepared another report concerning the silvical characteristics of different species. This report gives the same type of data as the other reports in this series. For a copy of this report, write to: Southeastern Forest Experiment Station, Asheville, N. C.

SILVICAL CHARACTERISTICS OF TAMARACK. This report is another of the series being prepared by the Lake States Station covering the information concerning the silvical characteristics of different species. This particular report deals with the Tamarack. This subject has been prepared by Eugene I. Roe. It contains 22 pages of descriptive literature.

POIRIER
Extraction Systems

Reduce Costs
•
Increase Production
•
More Uniform Sheet
•

Here's how: —

- Automatically provides correct vacuum at all suction boxes.
- Eliminates large suction pumps and costly maintenance.
- Provides longer wire life.
- Makes possible working of more water into the sheet.
- Scrutinizes every inch of sheet.
- Assures proper amount of air coming through sheet at dry boxes.
- Operates automatically regardless of stock weight or grade.
- Assures correct moisture content in sheet at the dandy.

These are just a few of the reasons why a Poirier Baromatic Syphon System is so popular. It will help you too.

Write for full information today.

POIRIER CONTROL COMPANY
Waterville 9, Maine

Specialists in Stock Control Equipment

PUT ACTION IN YOUR SAFETY PROGRAM

Add a touch of showmanship to your safety program. Films let you tell your training story with the dramatic impact of pictures . . . action . . . sound. You can cut your safety training in half, give fewer refresher courses and get better results by using training films.

Here are three film sets that will help you arouse and keep alive interest in your safety program. And there is no better way to teach foremen how to be better supervisors.

SPEAKING OF SAFETY

A brand new set of films that will teach your foremen and supervisors the tips they should know about making safety talks, and how to transmit management's ideas and plans. Six 35mm sound slidefilms and leader's manual in an attractive leatherette case.

HUMAN FACTORS IN SAFETY

This is a series of six 35mm sound slidefilms with leader's manual that may be used for an advanced safety course. Each film deals with one aspect of the complex art of handling people. Collectively, the films show how to train workers, how to keep experienced people on their toes and how to win respect, cooperation and loyal support.

SAFETY MANAGEMENT FOR FOREMEN

A set of ten 35mm sound slidefilms—all that is needed for a course in safety fundamentals. The films explain how to organize a safety program, what part the foreman plays in the program and how safety increases production. They also discuss specific safety activities, such as machine guarding, safety inspections, the first aid program, etc. Complete with leader's manual in an attractive leatherette case.

Write for complete information and details to the

NATIONAL SAFETY COUNCIL

425 North Michigan Ave., Chicago 11, Illinois

New Literature . . .

Copies are available from: Lake States Forest Experiment Station, St. Paul 1, Minn. Ask for Station Paper No. 52 dated September 1957.

SILVICAL CHARACTERISTICS OF SAND PINE. Sand pine, which has recently become one of the important forest trees of the United States, is the subject of this 8-page report. The report covers the habitat conditions, life history and other characteristics of this species. For copies of this report, write to Southeastern Forest Experiment Station, Asheville, N. C.

Manufacturers' Publications

These items are numbered for your convenience. Copies of the publications may be requested at no obligation through our Readers' Service Dept. Use the handy business reply card which accompanies this issue.

Cellulose

Buckeye Cellulose Corp. Div., Procter & Gamble Co. is offering a booklet titled, "Buckeye—First in Cellulose". This booklet gives the story of the company's growth. Buckeye, a pioneer in cellulose, conceived the idea of converting cotton linters into paper pulp and has served industry since 1901 by supplying the basic ingredient for making its products.

Circle No. 44 on Readers' Service Card

Colorimetric titrator

Photovolt Corp. is offering a bulletin describing the company's Lumetron Colorimetric Titrator Model 401-T, comprising the combination of the Photoelectric Colorimeter Model 401 with the recently developed Titration adapter. The bulletin gives data on application and description of the unit.

Circle No. 45 on Readers' Service Card

Hydraulic clamp cutters

E. P. Lawson Co. Div., Miehle-Goss-Dexter Inc. is offering a four-page bulletin completely describing the recently-introduced Lawson Pacemaker hydraulic clamp cutters. These cutters are available in 60, 66 and 69 in.

Circle No. 46 on Readers' Service Card

Heat exchanger

Ross Heat Exchanger describes and illustrates the new design of the type BCF exchanger in a new bulletin just published by the company. Specifications pages give details of the 16 sizes in one-, two- and four-pass designs. An additional page of information on modification for special conditions is also included.

Circle No. 47 on Readers' Service Card

Machine rolls

Mount Hope Machinery Co. has prepared three illustrated folders describing the operation and application of the company's rolls — covering, in order, fourdriniers, cylinder machines and converting.

Circle No. 48 on Readers' Service Card

Polyvinyl alcohol

Shawinigan Resins Corp. has published a booklet describing Gelvatol — a polyvinyl alcohol. Gelvatol applications include paper sizings and coatings, protective films and various types of specialty adhesives. The booklet fully describes the properties, modifications and uses of this product.

Circle No. 49 on Readers' Service Card

Engineers

Industrial Plants • Textile & Paper Mills • Location Studies • Appraisals • Reports • Surveys

J. E. SIRRINE COMPANY

GREENVILLE SOUTH CAROLINA

Pulp and Paper Specialists

CALKIN & BAYLEY, INC.

Industrial Consultants

50 East 41st St., New York 17, N. Y.

Lexington 2-1954

Analysis of long-term markets

U. S. Department of Commerce has made reprints of the article, "Analysis of Long-Term Markets—Measuring Product Trends and Potential." This article covers many interesting and essential phases of future demand projections including differentials in product growth, correlation in market analysis, response to business activity, cyclical vs. long-term demand and basis for long-term projections.

Circle No. 50 on Readers' Service Card

Chain belt

Chain Belt Co. announces the publication of its new catalog titled, "Mechanical Power Transmission and Conveying Machinery". The catalog contains descriptions, specifications, application information and selection data on the company's products for power transmission, conveying and elevating service.

Circle No. 51 on Readers' Service Card

Pocket slide for pipe insulation

Union Asbestos & Rubber Co. is offering a handy slide fact-finder for pipe insulation. This pocket-size fact-finder permits the user to quickly and easily select the most economical thickness of pipe insulation.

Circle No. 52 on Readers' Service Card

Use of polyethylene in packaging

Bakelite Co. has described the many uses of polyethylene in modern packaging in a new eight-page booklet titled, "1958 Guide to Improved Packaging".

Circle No. 53 on Readers' Service Card

Adjustable-speed drives

General Electric Co. has published a 16-page booklet illustrating and describing the company's new line of packaged dc adjustable speed drives available from 3-150 hp.

Circle No. 54 on Readers' Service Card

Flexible couplings

T. B. Woods's Sons Co., in an eight-page bulletin, tells how to select new Sure-Flex couplings suited to more than 150 different service applications. Five tables short-cut the engineering calculations to give the right answer in a matter of seconds.

Circle No. 55 on Readers' Service Card

Fiberpress

Sprout, Waldron & Co. Inc. has printed a new technical bulletin on the company's Anderson Fiberpress, which fiberizes while it removes dissolved solids at high concentrations. Engineering drawings and product as well as installation photos are included in this 4-page catalog, which also describes construction, application and operating features.

Circle No. 56 on Readers' Service Card

CLASSIFIED ADVERTISING

INDUSTRIAL ENGINEER WANTED

Graduate Industrial Engineer with practical experience in the paper industry. A knowledge of paper finishing is desirable. Should have ability in organization, expansion, mechanization and labor relations. Under 38 years of age, good salary and benefits. Fine opportunity for a man who is energetic and desires a challenge. Send detailed resume of experience and education to Personnel Manager, West Virginia Pulp and Paper Co., Luke, Maryland.

AGENTS

Wanted to sell new Tin base slime control material. Non-corrosive to wires. Paper mill personnel may act as agents in spare time. Confidential. Write Box 657, The Paper Industry.

Opportunity for Process Engineer in paper coating plant. Engineer required to do production assistance in paper coating operations and to establish and maintain specification work in production. Experience in web handling and chemical background desirable. Location in Great Lakes area. Address replies to Box 663, The Paper Industry.

CONFIDENTIAL EMPLOYMENT SERVICE

For employers seeking new personnel and mill executives seeking new positions. We invite your inquiry.

CHARLES P. RAYMOND SERVICE, Inc.

294 Washington Street LIberty 2-6547 Boston 8, Mass.

Large industrial user desires mill source for direct purchase of 16, 20, 24 lb. bond and 8 pt. White Coated paper. Immediate reply desired, Station B, Box #1171, Cleveland, Ohio.

DESIGN ENGINEER WANTED

Experienced in heat transfer equipment, boilers and thermo dynamics. Some board work. Location South. Reply to Box 664, The Paper Industry.

ROGERS

KNIFE GRINDERS

HEAVY DUTY SERIES 220

Pictured is standard 210" Model 220 equipped with 15 HP Motor and 20" Segmental Grinding Wheel.

Rogers Heavy Duty Model 220 Grinder furnished in sizes from 78" to 240" with mechanical or hydraulic drive. Grinding Heads from 10 HP to 40 HP with segmental grinding wheels from 16" to 30" diam. Rogers Grinders have guaranteed built-in accuracy to produce the best grinding results. Many models and sizes from which to choose. Write for complete information.

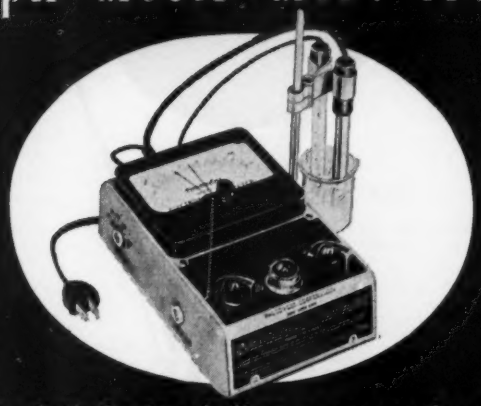
SINCE 1887

SAMUEL C. ROGERS & CO., INC.

2070 SHERIDAN DRIVE • BUFFALO 23. NEW YORK

PHOTOVOLT

pH Meter MOD. 115



A full-fledged line-operated pH Meter of remarkable accuracy at the unprecedented price of **$130.-**

(complete incl. electrodes)

Write for bulletin #225 to

PHOTOVOLT CORP.

95 MADISON AVE NEW YORK 16, N. Y.

FITCHBURG "RESISTO"

Stainless Steel Screen Plates

Simple Construction:

Heavy one-piece steel plate.
One-piece Bronze "shock-absorber" grid frame.
Joined with forged-in Inconel rivets. (no welding)

Highest Capacity: Cut with our famous "DUPLEX SLOTS," giving top screening capacity.

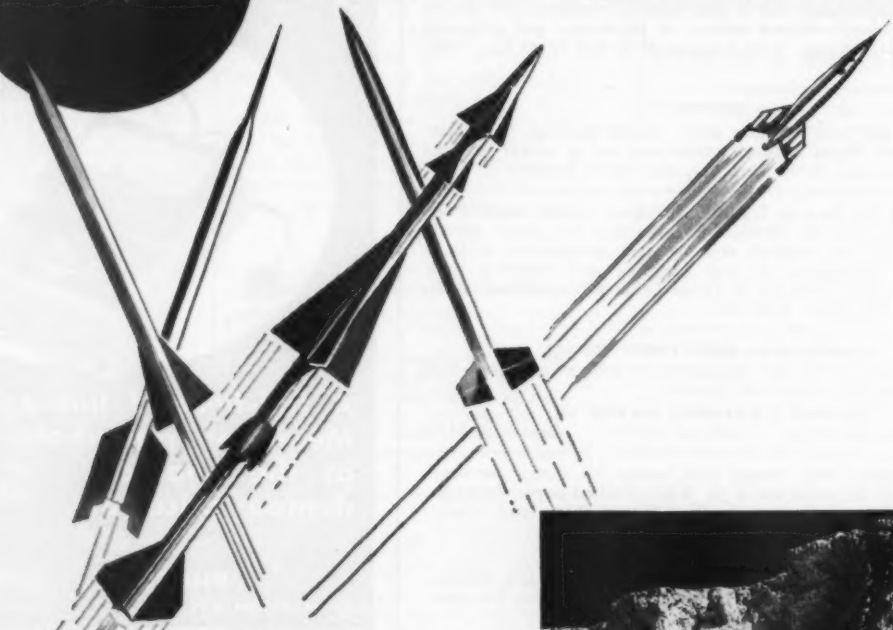
Instantly Interchangeable: With any standard 3/8" Bronze plates either Drilled or Beveled edge.

Also available 5/8" thick for "T"-Bar installation.

FITCHBURG
Screen Plate Co., Inc.
301 South St., Fitchburg, Mass.

Back view showing simple, rugged, two-piece construction.

SULPHUR *helps to create* **HEADLINE** *products*



BORANES

The latest word in rocket and missile fuels!

This combination of Boron as the active oxidizable ingredient and hydrogen peroxide as the powerful oxidizing agent is proving to be one of the most powerful propellent fuels yet developed. The mixture is called BORANE.

Both Boranes and Hydrogen Peroxide owe their existence to Sulphuric Acid, the important reaction chemical in changing borax into boric acid from which the Boranes are derived. Sulphuric Acid also is the starting point in the production of hydrogen peroxide.

It is difficult to find any commodity stemming from chemicals, either organic or inorganic, that doesn't meet up with Sulphur or a derivative somewhere along the line. Quite often the Sulphur radical appears in the chemical structure of the commodity itself. Many, many times it plays an important role in the production of the headline product . . . just as in the case of the BORANES.

Texas Gulf Sulphur Co.

75 East 45th Street, New York 17, N. Y.
811 Rusk Avenue, Houston 2, Texas

Sulphur Producing Units
- Newgulf, Texas
- Moss Bluff, Texas
- Spindletop, Texas
- Worland, Wyoming

MARKET QUOTATIONS

RAGS (Domestic)

New Cotton Cuttings

The following are brokers' and large dealers' average buying prices for sizeable lots in cents per pound f.b.o. New York:

	per cwt.	
No. 1 white shirt cuttings	13.00—	13.50
Soft unbleached muslins	15.50—	16.00
Fancy shirt cuttings	4.50—	5.00
No. 1 percales	5.50—	6.00
No. 1 washables	2.25—	2.50
No. 1 light silesias	6.50—	7.00
No. 1 light prints	4.75—	5.00
Light flannelettes	6.50—	7.00
Cottonades	2.75—	3.25
Blue overall cuttings	6.75—	7.25
Blue cheviots	6.75—	7.25
Canton flannels, bleached	10.50—	11.00
Canton flannels, unbleached	10.50—	11.00
Osnaburg cuttings	9.50—	10.50
Underwear cuts, bleached	14.50—	15.00
Underwear cuts, unbleached	14.50—	15.00
Sun tan khaki cuttings	5.00—	5.50
American linen cutting	—	

Cotton Rags

The following are prices, cents per pound, paid by dealers and brokers f.o.b. New York:

	per cwt.	
No. 1 roofing (Chicago)	.70—	.75
No. 2 roofing (Chicago)	.50—	.55
Twos and blues, repacked	1.50—	1.75
Thirds and blues, repacked	1.50—	1.75
No. 1 whites, repacked	—	
No. 1 whites miscellaneous	—	
No. 2 whites, repacked	—	
No. 2 whites, miscellaneous	—	

RAGS (Foreign)

(ex dock New York City)

New Rags

per cwt.

Nominal:
- New dark cuttings
- New mixed cuttings
- New light silesias
- Light flannelettes
- Unbleached cuttings
- New white cuttings
- New light oxfords
- New light prints

Old Rags

per cwt.

Nominal:
- No. 1 white linens
- No. 2 white linens
- No. 3 white linens
- No. 4 white linens
- No. 1 white cottons
- No. 2 white cottons
- No. 3 white cottons
- No. 4 white cottons
- Extra light prints
- Ordinary light prints
- Medium light prints
- Dutch blue cottons
- French blue cottons
- French blue linens
- Checks and blues
- Linsey garments
- Dark cottons
- Old shopperies

ROPE and BAGGING

F.o.b. and ex dock New York City

Gunny No. 1, domestic	4.75—	5.00
Gunny No. 1, foreign	4.50—	5.00
No. 1 manila rope, domestic	—	
No. 1 manila rope, foreign	—	
New burlap cuts (soft)	6.00—	6.50
Sisal strings	—	
Mixed strings	—	

WASTE PAPER

The following are prices, dollars per net ton, paid by brokers and large dealers for carload quantities of baled stock, f.o.b. cars New York:

No. 1 hard white envelope cuttings	105.00—	115.00
No. 1 hard white shavings	85.00—	90.00
No. 1 soft white shavings	50.00—	55.00
Soft white shavings, uncoated	55.00—	65.00
Fly leaf shavings No. 1	17.00—	22.00
Fly leaf, woody, No 1	17.00—	22.00
Mixed colored shavings	18.00—	20.00
No. 1 books and magazines	17.00—	18.00
Ledger stock, white, No. 1	40.00—	45.00
Ledger stock, colored, No. 1 (Midwest ship)	25.00—	
New manila envelope cuttings (free of groundwood)	60.00—	65.00
New manila envelope cuttings (containing groundwood)	50.00—	55.00
Manila tab cards	50.00—	60.00
Colored tab cards	40.00—	50.00
New northern kraft envelope cuttings	60.00—	65.00
Triple sorted kraft, 100%	25.00—	30.00
No. 1 old kraft	25.00—	
White news cuts, No. 1	45.00—	50.00
No. 1 overissue news	14.00—	16.00
Folded news, special	15.00—	16.00
Folded news, ordinary	12.00—	14.00
Old corrugated boxes	20.00—	21.00
New jute corrugated cuts	19.00—	20.00
Mill wrappers	9.00—	11.00
Boxboard cuttings	6.00—	7.00
No. 1 mixed paper	3.00—	5.00

CHEMICALS

F.o.b. New York City

Alum, ammonium Granular, bags, works, cwt.	4.30—	
Lump, drums, works, cwt.	5.05—	
Powdered, drums, works, cwt.	5.20—	
1-Arginine, drums, kilo	74.80—	
Blanc Fixe Direct process, bags, c.l., works, ton	115.00—	
L. c. l., ton	125.00—	
Bleaching Powder, drums, cwt	—	
Casein, domestic acid precipitated 30-mesh bags, 10,000-lb. lots or more, shipping point, lb	.56—	
80-mesh bags, 10,000-lb. lots or more, shipping point, lb	.64—	
China Clay, domestic dry-ground, airfloat, 99% 325-mesh bags, c.l., Georgia works, ton	10.00—	
300-mesh bags, c.l., Georgia works, ton	13.50—	14.50
Imported, white, lump, bulk, c. l., ex dock Phila, Portland, Me., gross ton	20.00—	35.00
Chlorine, liquid Tanks, single units, works, freight equaled, cwt.	3.15—	
Glycerine, refined (CP, USP) 99%, drums, c. l., delivered lb.	.29⅜—	
Litharge, commercial powdered Barrels, c. l., works, freight equalled lb.	.14¾—	
Rosin, gum, c. l., f.o.b. New York, cwt. B	—	
F	—	
G	—	
WW	9.80—	
Rosin, wood, c. l., f.o.b., shipping point, cwt. K, M	7.80—	
N	7.90—	
WG	8.25—	
WW	8.50—	
Saltcake, domestic, bulk works, 100% Na_2SO_4 basis ton	28.00—	
Soda Ash Dense, 58%, paper bags, c.l. works, cwt	1.90—	
Light, 58%, paper bags, c.l. works, cwt	1.85—	
Soda, caustic Flake, 76%, drums, c. l. works, freight equalled, cwt.	4.70—	
Solid, 76%, drums, c. l. works, cwt.	4.30—	
Sodium Silicate 40°Be, 1:3, 2, turbid, drums, c. l., works, cwt.	1.55—	
52°Be, turbid, 1:2, 4, drums, c. l., works, cwt.	2.65—	
Starch Pearl, 140-lb. bags, cwt.	7.53—	
Pearl, 100-lb. bags, cwt.	7.38—	
Powdered, 100-lb. paper bags, cwt.	7.50—	
Sulfur, crude Bulk, c. l. mine, contract, long ton	23.50—	
Talc Domestic, fibrous, N. Y., grd., bags, c. l. works, ton	28.00—	
Canadian, ground, bags, c. l. works, ton	20.00—	35.00
Titanium Pigment Calcium-rutile base, regular, bags, c. l., lb.	.09⅜—	
High-tinting, drums, c. l., lb.	.14⅜—	
Zinc Oxide Pigment, American process Lead-free, bags, c. l., freight allowed, lb.	.14½—	
Leaded, 35%, bags, c. l., freight allowed, lb.	.15½—	

WOOD PULP

Quotations on domestic and Canadian pulp, dollars per short air-dry ton delivered consuming mills including basic allowances, follow:

Bleached sulfite, No. 1	150.00—	
Bleached sulfite, Canadian	150.00—	
Unbleached sulfite	135.00—	
Unbleached sulfite, Canadian	135.00—	
Bleached soda	150.00—	
Bleached soda, Canadian	150.00—	
Kraft, bleached hardwood	152.00—	
Kraft, bleached	157.00—	
Kraft, bleached southern	160.00—	
Kraft, bleached Canadian	160.00—	162.50
Kraft, unbleached southern	120.00—	
Kraft, unbleached, Far West	125.00—	
Kraft, unbleached Canadian eastern	135.00—	
Kraft, unbleached Canadian western	120.00—	125.00
Kraft, semi-bleached southern	140.00—	
Sulfite screenings	—	
Sulfate screenings	—	
Groundwood, dom.	—	

Quotations on imported wood pulp, dollars per short air-dry ton on dock American Atlantic ports, follow:

Bleached sulfite, Swedish, freight allowed	155.00—
Bleached sulfite, Norwegian, del'd with limited freight allowance	155.00—
Bleached sulfite, Finnish, freight allowed	155.00—
Unbleached sulfite, Swedish, freight allowed	135.00—
Unbleached sulfite, Finnish, freight allowed	135.00—
Kraft, unbleached, Swedish, freight allowed	125.00—
Kraft, unbleached, Finnish, freight allowed	125.00—
Kraft, bleached, Swedish, on dock	157.50—162.50
Kraft, bleached, Norwegian	155.00—

PAPER

Quotations are mill quotations Chicago

Boards (prices per ton, delivered in Chicago, 10 tons or more):	
Plain chip	107.50
News vat lined chip	110.00
.009 chip, rolls	100.00
Filled news	111.50
Solid news	114.50
White vat lined chip	144.50
Chip tube and can stock	112.50
Single manila lined chip	162.50
Single jute lined chip	147.50
Container, 42-lb.	
Kraft liner (per 1000 sq. ft.)	2.68
White patent coated .020	175.00
.018	177.50
.016	182.50
Book Paper (f.o.b. Chicago, c.l. cases per cwt):	
No. 1 enamels	20.05
No. 2 enamels	19.05
Machine-coated, 45- to 100-lb.	15.05— 18.50
60-lb. + uncoated offset, 25 × 38 (2000 lb.)	17.05
"A" grade English finish untrimmed, 25 × 38 (2000 lb.)	16.15
Rag Content Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	per cwt
100% rag	64.70
75% "	49.65
50% "	37.80
25% "	31.90
Rag Content Ledger (white, 5000 to 10,000 lb., ream sealed cartons):	
100% rag	65.85
75% "	50.80
50% "	39.00
25% "	33.10
Sulfite Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	
No. 1	22.50
No. 2	21.75
No. 4	20.35
Sulfite Ledger (white, 5000 to 10,000-lb., ream sealed cartons):	
No. 1	23.70
No. 2	22.95
No. 4	21.55
Newsprint (contract base price)	per ton
Rolls, standard	135.00
Sheets	Standard differentials
Tissues (carlots)	per ream
White No. 1	
White No. 2	
Bleached anti-tarnish	
Colored	
Anti-tarnish kraft	
Manila	
Napkins, semi-crepe (12½ lb. to M shts) per case	
Napkins, full crepe and embossed (12½ lb. to M shts) per case	
Toilet, bleached (M shts) per case	
Toilet, unbleached (M shts) per case	
Wrappings (kraft, basis 50 lb. and heavier)	per cwt
Standard wrapping	9.50
Butchers, counter rolls	10.50
Standard bagging, mill rolls	
Shipping sack, mill rolls	
Gumming, mill rolls	
Asphalting, mill rolls	
Envelope, mill rolls	

FOREIGN ABSTRACTS

Microstructure of beech pulp fibers

The diameters of the microfibrils in various cells present in beechwood sulfite pulp were carefully measured by using an electron microscopic technique. The extreme range in these diameters was 120-130 Angstrom units (A), which was considerably below that found in the microfibrils of coniferous woods, where the range of microfibrils (in tracheids) was 210-290 A.

In beech the individual botanical elements also showed the following marked gradations in the range in diameters of microfibrils: for those of libriform fibers, 180-230 A; those of vessels and tracheids, 150-200 A, and those of ray cells, 120-160

Fig. 1

A. Differences are shown in a series of electronmicrographs. Thus, Fig. 1 shows the primary and secondary walls and the fibrillae of a bleached beechwood rayon sulfite fiber.

Georg Jayme and Eberhard Koburg. *Das Papier* 11, 443-5 (1957). (In German with brief English and French summaries.)

Groundwood from chips instead of bolts

Mill-scale experiments in which mechanical pulp was produced from chips gave satisfactory results. Power consumption was lowered, labor costs were less, and the investment cost per unit was also lower than that required in the conventional production of groundwood.

In Norway the technique should permit the utilization of slabs and waste wood, but due to the high transportation costs of the raw material a mechanical pulp mill of the type mentioned to be most profitable should be built in small units near the source of fibrous raw material.

Hans E. Kinck. *Norsk Skogind.* 11, 390-2 (1957). (Original in Norwegian with brief English summary).

Peroxide bleaching of sulfite pulp

One-stage bleaching was studied, as well as the effects of certain pretreatments.

When the peroxide (based on the dry weight of pulp) was 1.5 per cent, no brightness increases were about 13-14 G. 6 G. E. units were noted. When 5 per cent peroxide was used, the maximum brightness increases were about 13-14 G. E. units. Various stabilizers were used in the peroxide bleaching operations, and sulfur dioxide was applied after each bleach. Acid pre-treatments with hydrochloric acid or sulfuric acid failed to improve the results with peroxide. However, a mild hypochlorite (or hypochlorous acid) pre-treatment improved the results so that a maximum brightness increase of about 20 units could be obtained. When the pulp was not washed thoroughly after such pre-treatments, the maximum brightness increase was only about 18 units, but the yield increased about 1 per cent.

In the bleaching operation it is important that the peroxide should not be consumed completely; i.e. there should be a residue of about 0.2-0.3 per cent. An increase in the alkalinity of the peroxide increased its consumption but improved the brightness. A suitable mixture that was used as stabilizer consisted of 5-per cent (40° Bé) sodium silicate solution and 0.06 per cent Epsom salt. When the amount of stabilizer was decreased, peroxide consumption increased.

Although bleaching temperatures were not studied thoroughly, the over-all influence of temperature on brightness was small; only the reaction rate of bleaching was affected.

Eight tables and seven references are given. Y. Hentola, N. Hakkarainen, C. Backlund and H. Sihtola. *Paperi ja Puu* (Finland) 39, 501-508 (1957). (In English).

Fiber length measurements with a semi-automatic recorder

The recording method of the Finnish Pulp & Paper Research Institute is described in detail.

It depends on an optical projection of a stained fiber preparation on a screen, using a 50-diam. magnification. Measurements are made on the projected image by means of the curvimeter of the fiber length recorder.

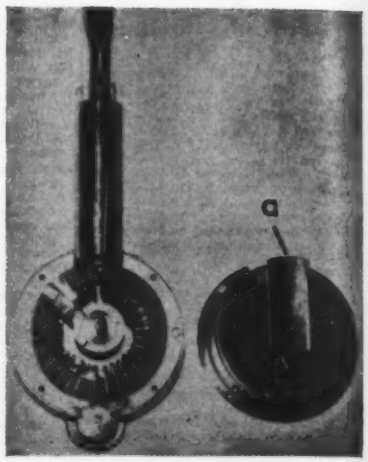


Fig. 2

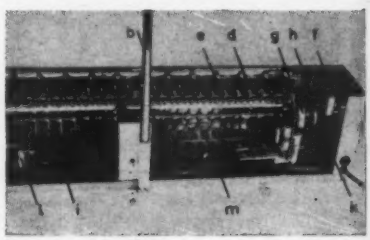


Fig. 3

The inside of this curvimeter is shown in Fig. 2. This has a wheel and electric contacts, provided with push lever (a). The interior of the latest model of the recorder is shown in Fig. 3. Here, (b) shows cables leading to the curvimeter; (d) indicates the 28 counting relays (one for each fiber group), which are provided with spring contact groups (e). There is a counting relay (f), which together with a graduated-notched wheel (g) and motor-driven clutch mechanism (h) counts the total length of the fibers; (h) is provided with stoppers (i), one for each fiber length group. A zero-setting mechanism for the fiber group counting relays has an impulse transmitter (l) and push-button switches (m). The preparation of slides, the projector and recorder operations are described fully.

The method has been used in the quality control of pulps and in studying the different stages in pulp mill and bleaching operations. Data are given for unbleached spruce sulfite, pine kraft pulps, for spruce dissolving pulps, curlated bleached spruce sulfite and for bleached aspen pulps.

Three tables, seven references and seven figures are included. Marja-Sisko Illvessalo-Pfaffli and Georg. v. Alfthan. *Paperi ja Puu* (Finland), 39, 509-516 (1957). (In English).

Index to Advertisers

Acme Steel Company 976
Adell Chemical Company .....
Aerovent Fan Company, Inc. .....
Albany Felt Company 979
American Cast Iron Pipe Co. 1032
American Cyanamid Co. 974-975
American Defibrator, Inc. 1044
American Industrial Clays, Inc. .....
Anheuser-Busch, Inc. .....
Appleton Machine Co., The .....
Appleton Wire Works, Inc. .....
Appleton Wood Products Co. 1053
Appleton Woolen Mills .....
Arnold, Hoffman & Co., Inc. .....
Arrow Tank Co., Inc. .....
Asten-Hill Mfg. Co. .....
Atkins Saw Division 1035

Bahnson Company, The .....
Bauer Bros. Co., The 971
Beloit Iron Works 1005-1006
Bird Machine Company 1014
Black-Clawson Company, The .....
Bowsher Co., The N. P. .....
Burgess-Manning Company .....

Cameron Machine Co. .....
Carthage Machine Co. .....
Chemipulp Process, Inc. .....
Chicago Bridge & Iron Company 978
Clarage Fan Company 964
Classified Advertising 1049
Clinton Corn Processing Co. 1024
Corn Products Refining Co. .....

Darling & Company .....
Dempster Brothers 977
DeZurik Corporation 1036
Draper Brothers Company 1017

Eastwood-Nealley Corporation ..... 4th Cover
Electric Eye Equipment Co. 968-969
English China Clays Sales Corp. 1026

Fisher Governor Co. .....
Fitchburg Screen Plate Co., Inc. 1049
Fritz Publications, Inc. 963, 1031

General Chemical Division .....
General Dyestuff Company 1011
General Mills, Inc. .....
Gifford-Wood Co. .....
Gilbert & Nash Company .....
Graton & Knight Company .....

Hanchett Manufacturing Co. 1031
Hills-McCanna Company .....
Horton Manufacturing Co., Inc. 1022
Hubinger Company, The 1028
Humphrey Elevator Company 1046
Huyck Felt Co. 998-999

Illinois Gear & Machine Company 1027
Improved Machinery, Inc. 981
Ingersoll-Rand 1023

Jeffrey Manufacturing Co. .....
Jenkins Sons, Inc., M. W. 1045
Jenssen Company, Inc., G. D. .....
Johnson Corporation, The 1016
Jones & Sons Company, E. D. 1000

Kalamazoo Tank & Silo Co. 1029
Kamyr Inc. 972

Ladish Co. .....
Langston Co., Samuel M. 1042
Layne & Bowler, Inc. 1009
Lindsay Wire Weaving Co., The .....
Link-Belt Company ..... 2nd Cover
Lockport Felt Company .....
Lodding Engineering Corp. .....
Lunkenheimer Co., The .....

Master Builders Co., The .....
Mead Pulp Sales, Inc. .....
Moisture Register Co. 1043
Monsanto Chemical Co. 1013

Morden Machines Company .....
Murray Mfg. Co., D. J. 1038

Nash Engineering Co., The 1025
National Aluminate Corp. .....
National Safety Council 1048
Naylor Pipe Company 1030
Northwest Engineering Company .....
Norton Company .....

Paper Industry, The 963, 1031
Penick & Ford, Ltd., Inc. .....
Photovolt Corporation 1049
Poirier Control Company 1047
Powell Valves 1018
Pusey & Jones Corp., The .....

Charles P. Raymond Service, Inc. 1049
Rogers & Co., Samuel C. 1049
Ross Midwest Fulton Corp. .....

Sandy Hill Iron & Brass Works, The .....
Scapa Dryers, Inc. .....
Shuler & Benninghofen 1041
Smidth & Co., F. L. .....
Standard Oil Co. (Indiana) 973
Stickle Steam Specialties Co. 1037
Swenson Evaporator Company ..... 1st Cover

Taylor-Wharton Co. 970
Tennessee Corporation .....
Texas Gulf Sulphur Co. 1050
Titanium Pigment Corp. 1034

Valley Iron Works Company .....
Vanderbilt Co., R. T. 966

Washington Steel Corp. 980
Waterbury Felt Company 1031
Webb Company, Jervis B. 1021
Weyerhaeuser Timber Co. .....
Whiting Corporation ..... 1st Cover
Williams-Gray Company 1053

Yarnall-Waring Company ..... 3rd Cover

Professional & Business Service Section
Calkin & Bayley 1048
Sirrine Company, J. F. 1048

RES-LIN *wire saver*

SUCTION BOX COVER

offers these features:

1. Even distribution of fabric assures EVEN WEARING.
2. Ends of threads contact wire, assuring uniform surface to wire.
3. Increased wire life.
4. Many years of trouble-free service.
5. Resurfacing reduced to a minimum.
6. Expansion and contraction is reduced to a minimum.
7. Reslin can supply a greater open area without sacrificing strength.
8. Requires no wet storage or care when machine is down.
9. Easily installed.
10. No other can offer as even-wearing and wax-like surface as Reslin.

CANADIAN MANUFACTURING LICENCEE
Joseph Robb & Co.
5575 Cote St. Paul Rd.
Montreal 20, Quebec

MIDDLE-WEST REPRESENTATIVE
Frank Holloin
720 N. Rankin St.
Appleton, Wis.

NEW ENGLAND & NORTH ATLANTIC REPRESENTATIVE
George Clayton
1222 Linwood Ave.
Norristown, Penn.
Norristown, Pa.

SOUTHERN REPRESENTATIVE
Horace Hill
Rt. 7 — Box 926
Pensacola, Fla.

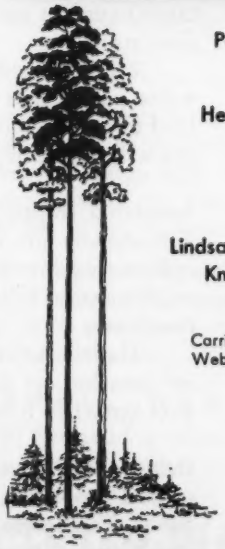
PROVEN BY TEST

Write for Further Information and Sample of Material

APPLETON WOOD PRODUCTS CO.
APPLETON, WIS.

WILLIAMS-GRAY COMPANY

221 North LaSalle Street, Chicago 1, Illinois



Paul Foster • Peter Talbot
Ross Lawrence
Herb Fishburn • Wes Gallup
Bill French

Lindsay & Niagara Wires
Knox Woolen Felts
Mount Vernon Dryer Felts

Carrier Rope, Splicing Tissues, Deckle Webbing, Apron Cloth, Wire Brushes

PAPER INDUSTRY

Whither?

... in production, processes, new products, markets

Return to "normality"

The slowed-down industrial activity does not presage the advent of a recession, according to R. M. Fowler, president of the Canadian Pulp & Paper Association, but merely a return to normality, in an economy of abundance, after 19 years of abnormality caused by war and its aftermath.

The days of maximum production at whatever costs are over. Emphasis now must shift to production efficiency, market development and merchandizing skills.

Chip storage in outside piles

While deterioration of stored pulpwood represents a great problem for the pulp and paper industry, it has been shown in recent tests that chip piles containing West Coast wood species show no serious deterioration when left for periods of up to three years. Chip-handling—involving a round trip from barge to chip pile and back to the digesters—amounted in one case to a cost of $1.25 per cord-equivalent, and it is generally believed that the cost of handling chips will be considerably lower than that of handling bolts.

It still remains to be determined whether such species as southern pine, northern hardwoods or aspens will show equal resistance to deterioration when stored in chip form.

Latex-wax coating shows many exceptional properties

Pliolite Latex 170 (a high-styrene resin emulsion with good heat-sealing characteristics) in combination with microcrystalline wax produces a paper coating with high resistance to water vapor, grease, oil, chemicals and abrasives. It has a minimum of blocking or self-adhesion. An optimum formulation, it is reported, contains 50 parts of Superla wax (melting at 170° F) and 100 parts of latex solids. Thickeners, such as methyl cellulose or Kelgin, are added to provide coating consistency to reduce penetration into the paper and insure continuous surface film with good gloss.

An adhesive in the form of a cord

A thermaplastic adhesive, in the form of a cord wound on a reel, that can be fed to a gluing machine where it is melted as it is used has certain advantages over hot melts that must be liquified in considerable quantity prior to their use.

While the adhesive now on the market is not suitable for inclusion in waste paper, B B Chemical Co. has a research program under way that will lead to certain modifications of the adhesive so that its presence in waste paper will not be objectionable.

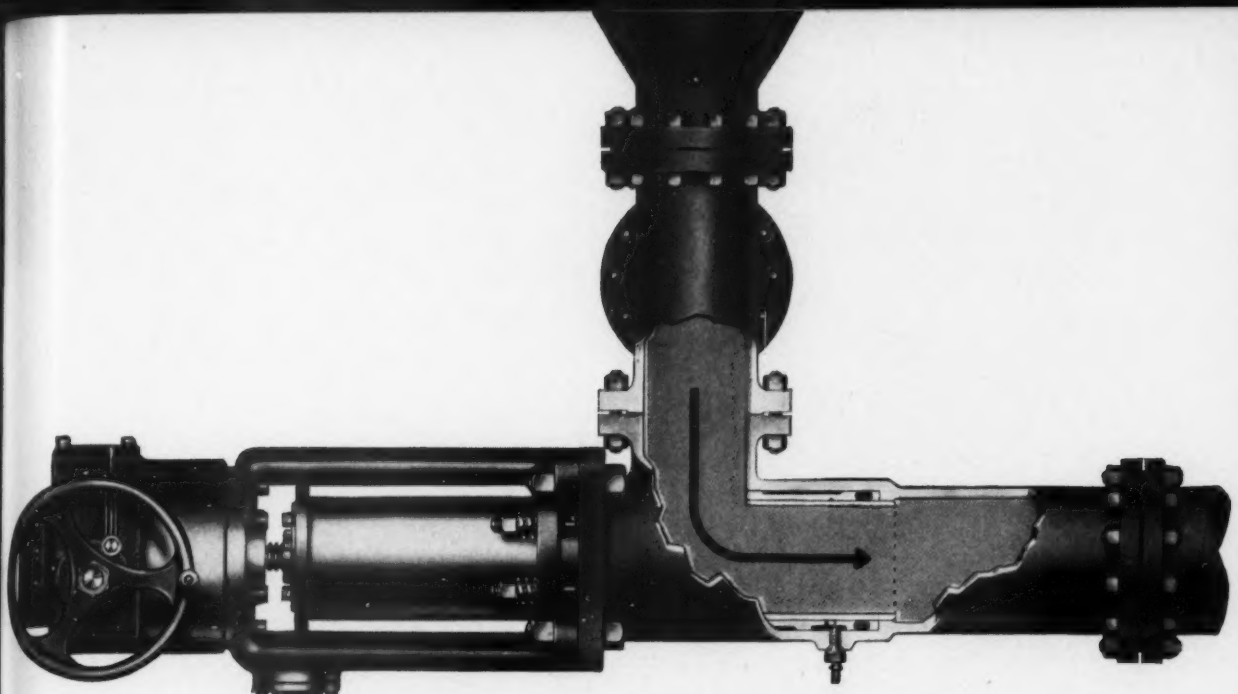
Tests to predict package performance

Simulated shipping evaluation tests to predict flexible packages' durability performance are carried out at Continental Can by a dynamic testing procedure that involves exposing the package to accelerated effects of train or truck motion, followed by storage under ambient temperature and humidity conditions.

The results of these tests, claimed to be reproducible, provide valuable information on durability performance and also on the appearance of the package when it reaches the modern merchandising shelf.

Torula yeast used in baby foods

Baby food processors have made the first substantial use of Torula yeast as a food product for human consumption. When used as an additive in baby foods, Torula yeast (grown in waste sulfite liquor) supplements the protein and Vitamin B content of high-protein meat products.



full, free digester discharge

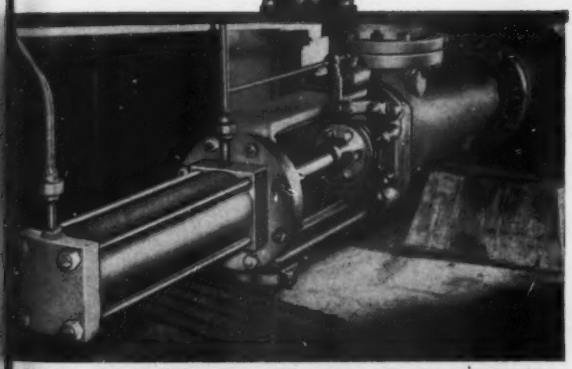
Digesters blow fast and clean with YARWAY Seatless Blow Valves.

The hollow sliding plunger has no pockets where wood chips or tramp materials can hang up.

All Yarway Digester Valves have full pipe area, permitting fast discharge with minimum pressure drop. Comparisons show greater discharge area—reducing blowing time, increasing number of cooks.

Scores of pulp mills report *lower operating costs* and *increased production* due to YARWAY Digester Blow Valves. One large mill found *savings in operation and maintenance the first year more than paid the cost of their 4 new Digester Valves!*

YARWAY Seatless Digester Valves can be furnished either with electric motor or hydraulic cylinder units. Both are remote controlled. Bulletin B-441 gives the whole story. Write for it.

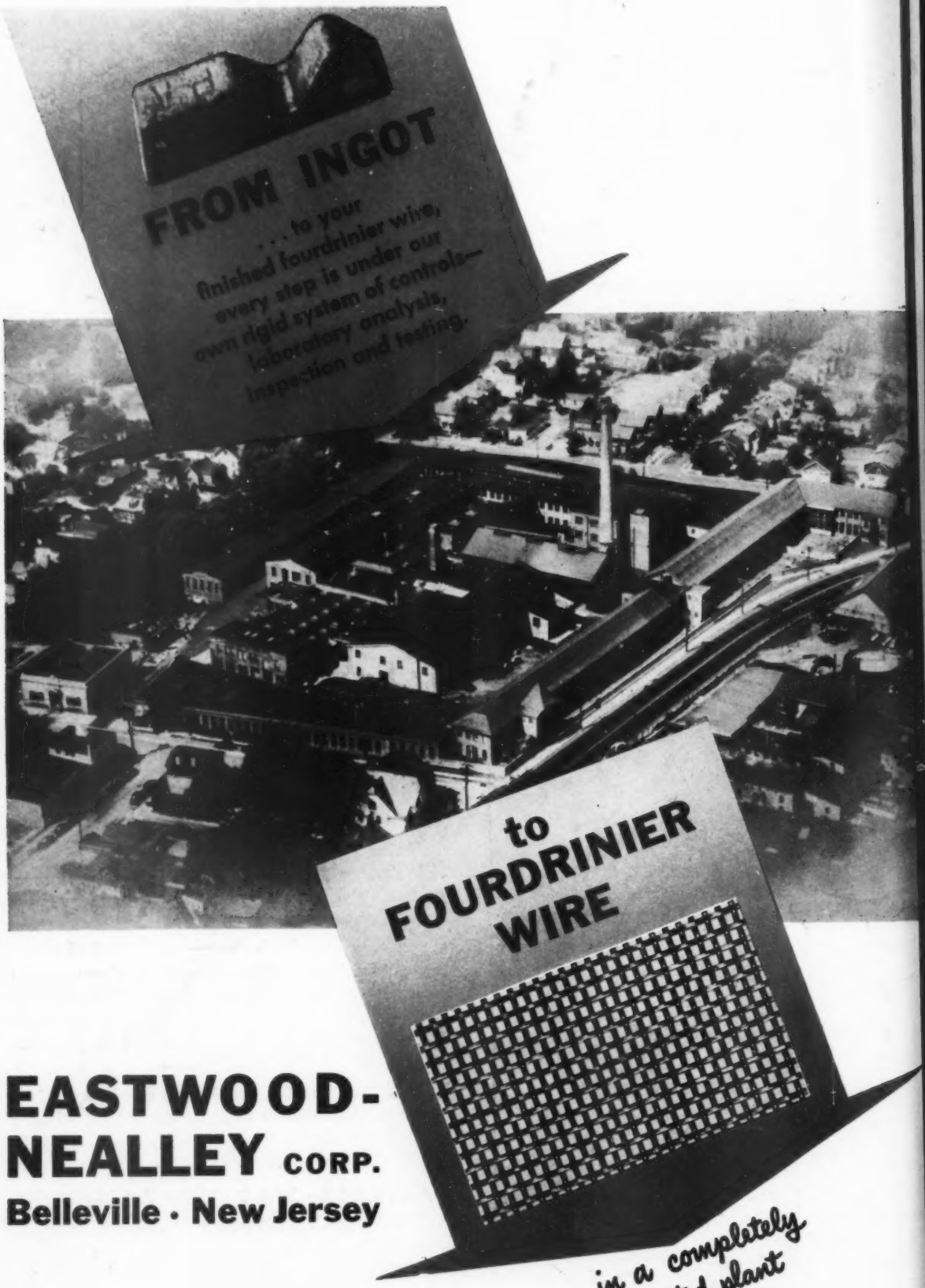


DRAULIC-OPERATED Yarway Digester Blow Valve—one of six in-ed at large North Carolina paper mill.

OTOR-OPERATED Yarway Digester Blow Valve—one of eight installed arge Canadian paper mill.

YARNALL-WARING COMPANY
149 Mermaid Avenue, Philadelphia 19, Pa.
BRANCH OFFICES IN PRINCIPAL CITIES

· DIGESTER BLOW VALVES



EASTWOOD-NEALLEY CORP.

Belleville · New Jersey